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1992

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Programming



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Three Days
in January



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to the Future



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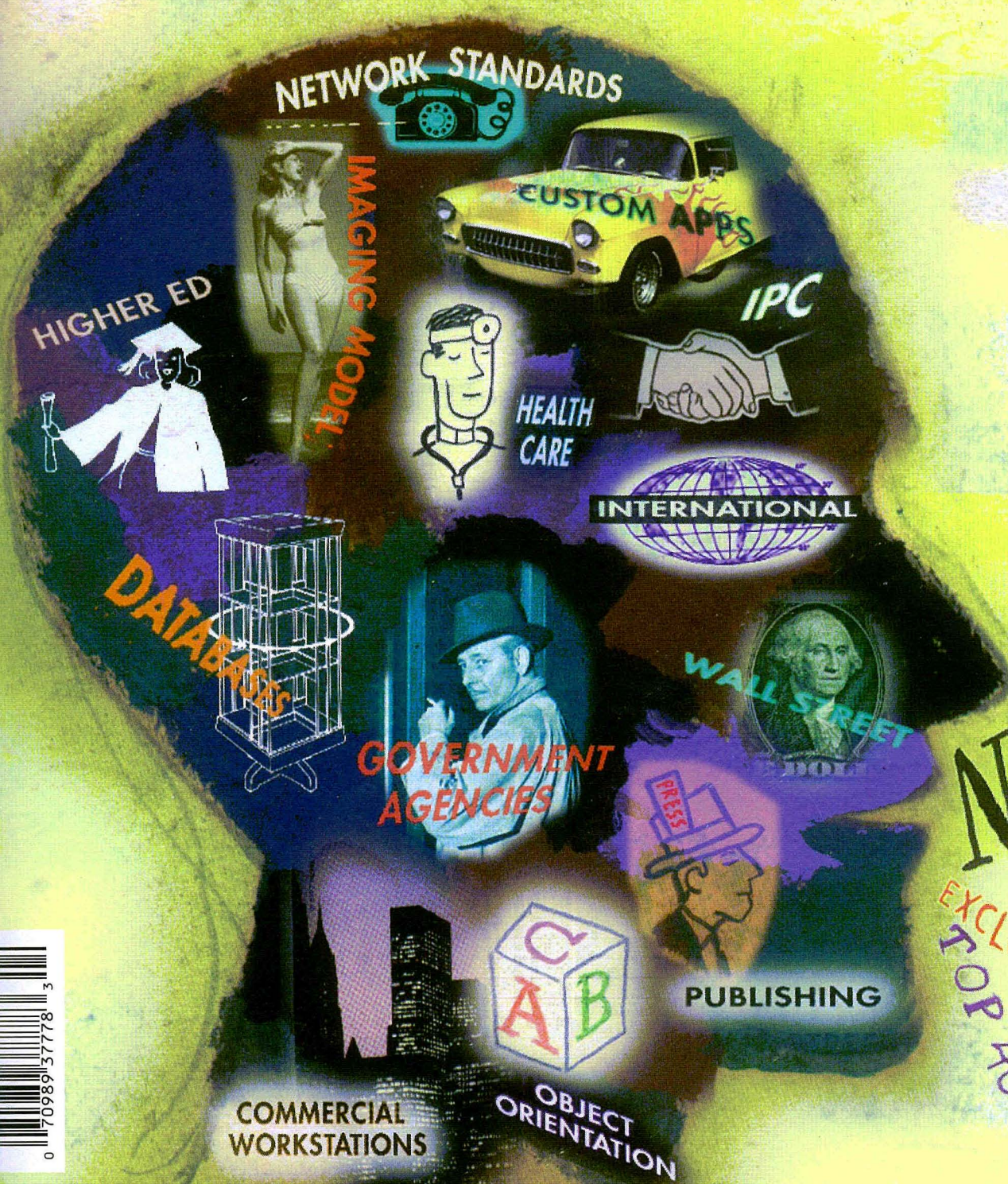
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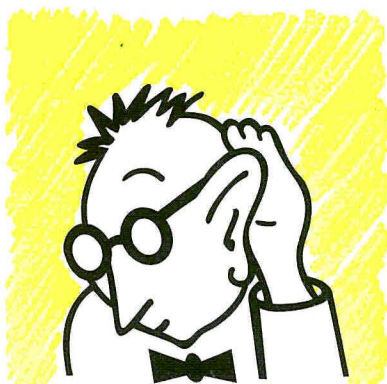


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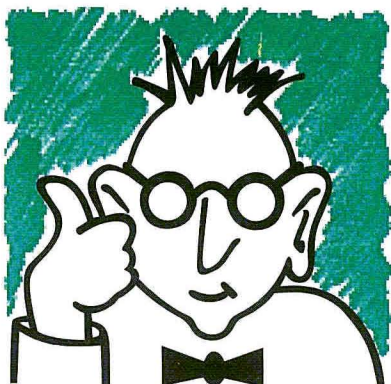
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Senior Editor Simson Garfinkel
Copy Editors Eliot Bergson, Sue Troy
Editorial Intern Kristin Dyer

Contributing Editors Joe Barello, John Perry Barlow, Tony Bovens, Cheryl Rhodes, Ben Calica, Don Crabb, Daniel Miles Kehoe, Robert Lauriston, Charles L. Perkins, Richard M. Reynolds, Seth Ross, Lee Sherman, Bruce Webster

ART AND DESIGN

Earl Office San Francisco, California
Command Z Palo Alto, California

PRODUCTION

Director of Manufacturing Jayne Boyer
Manufacturing Manager Hilal Sala

ADVERTISING SALES

Account Representative Jacqueline Caldwell
415/978-3188

ADMINISTRATION

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The NeXT market. Here, a spore of new applications for competition (the national

The goal is to reproduce rapidly, creating a products and services that be able to make money supporting faster delivery and greater value.

For this issue, we put a full Special Report, "NeXT Market trends, a survey of NeXT users attendees, and a list of the 40 of our planned annual studies.

The main conclusion of viable. While more nutrients are erate growth, it is evident that stable and self-sufficient.

Of the many factors affecting the market organism, the nourishment provided by itself. With its technology, a healthy medium for reproducing marketing strategies, NeXT can growth or, if unsuccessful, in a look at how NeXT is nourished.

★ ★

I won't dwell on the customer. I have already written that I move. NeXT has correctly a compelling sales advantage programming. I would add that for both third-party software its custom-apps strategy with must not neglect the kind of dreams of shopping at a NeXT.

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Whatever else Sun might calling Sun "the mother of a about the *NeXT Versus Sun* showed two programmers v NeXT development tools at the Sun programmer fails m only finishes the work but a

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Eliot Bergson, Sue Troy
Intern Kristin Dyer
ello, John Perry Barlow, Tony Bove and
a, Don Crabb, Daniel Miles Kehoe,
as L. Perkins, Richard M. Reynolds,
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AND DESIGN

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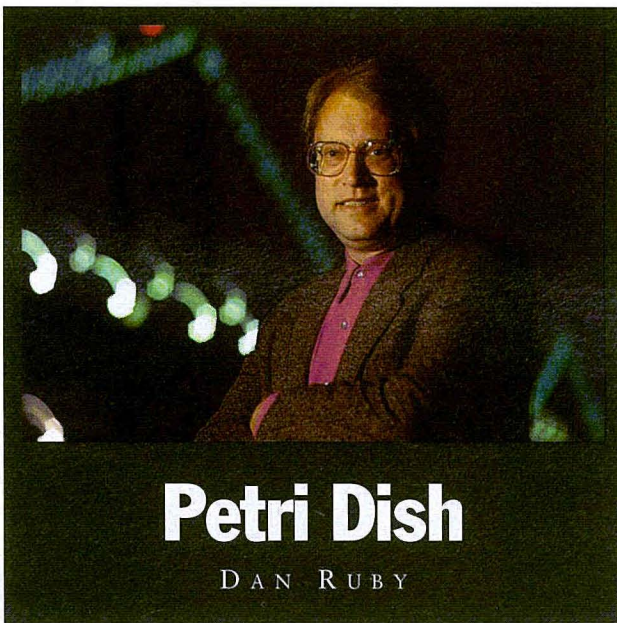
The NeXT market is like an organism evolving in a petri dish. Here, a spore breaks out in a new market (health care) or a new application (custom apps). Elsewhere, cells fail to multiply for competitive (Sun, Taligent, Microsoft) or environmental (the national recession) reasons.

The goal is for the genetic material in the petri dish to reproduce rapidly, creating a teeming environment of businesses supplying products and services that benefit customers. People with good ideas are able to make money supporting the platform. Users thrive through the faster delivery and greater variety of technology. Everybody wins.

For this issue, we put a few laboratory probes in the petri dish. Our Special Report, “NeXT Market Mosaic,” includes analysis of key market trends, a survey of NeXT usage patterns among *NeXTWORLD* Expo attendees, and a list of the 40 largest NeXT customer sites. This is the first of our planned annual studies of the NeXT marketplace.

The main conclusion of this year's report is that the NeXT culture is viable. While more nutrients are needed to accelerate growth, it is evident that the organism is stable and self-sufficient.

Of the many factors affecting the growth of the market organism, the most important is the nourishment provided by NeXT Computer itself. With its technology, NeXT provides a healthy medium for reproduction. With its marketing strategies, NeXT can promote rapid growth or, if unsuccessful, inhibit it. Let's take a look at how NeXT is nourishing the market.



Petri Dish

DAN RUBY

I won't dwell on the custom-apps strategy. I have already written that I think it is a terrific move. NeXT has correctly recognized that its compelling sales advantage is in ease of programming. I would add that this strategy has not-so-positive ramifications for both third-party software and channel distribution. As NeXT pursues its custom-apps strategy with a direct sales force and an array of VARs, it must not neglect the kind of user who buys shrinkwrapped software and dreams of shopping at a NeXT emporium on Main Street.

If the custom-apps strategy is a positive message, then in this year of negative political campaigning NeXT has shown it can also take the low road. I like the fact that the company has identified its major competitor as Sun Microsystems. Head-to-head comparative marketing is the right thing to do, but some of the tactics employed have sunk into the mud.

Whatever else Sun might represent, it isn't Saddam Hussein. Okay, calling Sun "the mother of all competitors" was simply silly, but what about the *NeXT Versus Sun: A World of Difference* video? The video showed two programmers working on the same problem, one using NeXT development tools and the other using the Sun. Not surprisingly, the Sun programmer fails miserably, while the NeXT programmer not only finishes the work but adds all kinds of bells and whistles.

The problem with this tactic is that it lacks credibility. I can't imagine any customers who might have been sitting on the fence going for NeXT on the basis of this trumped-up test. The message is right on the money,

but the execution is crude. A move I liked better was the Booz-Allen & Hamilton comparative study on NeXTstep versus other development environments. Of course, this too was not exactly nonpartisan: NeXT funded the research, although it had no role in the design or interpretation of the study. It's the same kind of thing Apple used to do so successfully to make its case for the Macintosh's ease of use. The results showed that extremely high percentages of programmers with experience in both Sun and NeXT development rated NeXTstep higher than other environments in five major quality measures.

To me, the Booz-Allen & Hamilton study was basic blocking and tackling, the kind of mature marketing that NeXT needs as it builds its case. I am also noticing a new maturity in some of the other ways that NeXT does business. In its early days, NeXT was known for its bunker mentality, controlling everything that went on around it. Information was jealously guarded. NeXT played favorites with its partners.

Now there are signs that NeXT is coming out of the bunker. One

indication is the formation of various interest groups around the NeXT that are not directly controlled by NeXT. For example, the Association of NeXTstep Developers International, or ANDI, promises to advocate for NeXT partners in a way it could not if it were directly affiliated with NeXT. At one time, NeXT might have actively discouraged such a group; now it is supportive.

The NeXT Publishing Alliance is another interesting case. NeXT encouraged the creation of this organization of publishing and graphics developers. But rather than enforce a standard approach to documents, NeXT simply put the matter on the table and stood aside to allow individual developers to behave in their own interest.

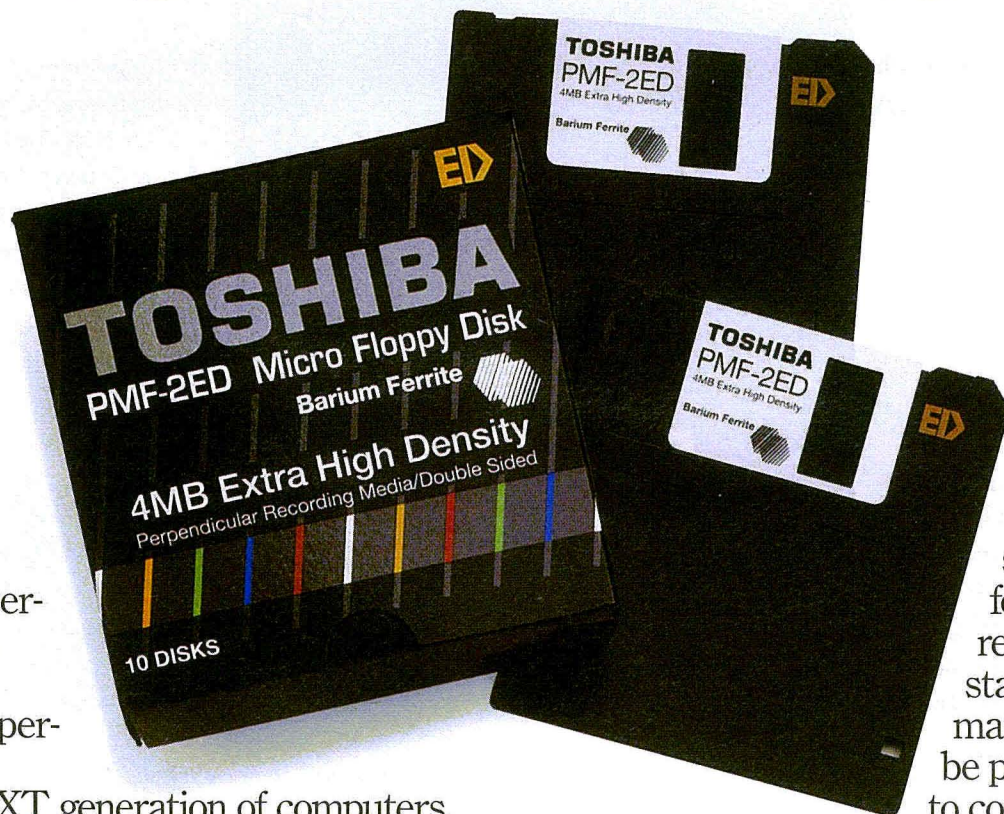
The user-group community will be more influential and independent than ever under the umbrella of NeXT Organizations International, or NOIR. And an association of NeXT's largest customers, now in formation, could become immensely powerful. These and other organizations share NeXT's basic goals, but their first loyalties are with the needs of their own members. While we might expect some of these organizations to come into conflict with the mother ship over particular issues in the future, NeXT is wise to allow them to develop as independent entities.

NeXT now recognizes that it can't do it all. It acknowledges this when it says that its customers are "self-selecting." The same is true for NeXT developers and partners. People don't buy – or support – NeXT machines just because Steve gives a great demo. They do it because NeXT hardware and software solve real problems and provide real benefits.

As long as NeXT focuses on real problems and benefits, both in its technology and in its marketing, then there is every reason to believe that the next time *NeXTWORLD* dips its probes in NeXT's petri dish, the culture will be not just viable, but flourishing. 🍷

DAN RUBY *is editor in chief of NeXTWORLD.*

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Gone but not forgotten

The sidebar "Goodbye Optical Disk" (in "Goodbye OD, Hello CD-ROM," *NeXTWORLD* Spring 1992) fails to mention a very big item: If you upgrade a Turbo model on the Cube, you will not be able to use your optical drive anymore. No path for allowing the discontinuing of the optical drive has been announced, which comes as a major blow.

DOUG MCCLURE
West Lafayette, Indiana

Although the optical drive is not a cost-effective means of distributing software, it is a very effective storage medium. The articles I read in *NeXTWORLD* Spring 1992 about the new CD-ROM drive discussing discontinuing the optical. This is ridiculous. When you've got a thing, make it work for you.

The engineers at NeXT should re-engineer the optical drive so it can read CD-ROMs. The CD-ROM could be placed inside an empty optical cartridge and then inserted into the optical drive for reading.

PETER J. RUCKI
Pittsburgh, Pennsylvania

While the optical drive seemed promising technology several years ago, it was plagued with reliability problems, and the cost of the cartridges never came down to less than \$140. It is not technically possible to re-engineer the optical drive so that it can read CD-ROM discs.—NW

CAD Vision

NeXT's concept of interperson computing and ease-of-information sharing misses an opportunity to return engineering to the team approach that was prevalent before engineering workstations — no one person could work in isolation. The project's success depended on

LETTERS

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close communication.

As an electronics engineer, I wistfully imagine a multit talented team of engineers and designers working on a complex project involving electronics, microprocessors, embedded software, mechanical fabrication, documentation, and aesthetic design; accomplishing their tasks at their own workstations; sending and receiving information that would let them dovetail their work with that of their colleagues.

Then I look at the engineering software for the NeXT, and I return to my PC running AutoCAD, OrCad, and WordPerfect, and I contemplate a change of careers. Why should stockbrokers, spooks, and talent agents get all the fun?

LOUIS BERTRAND
Lynden, Ontario

Clarifying ScanTastic

In the review of ScanTastic ("Universal Scanner Software," *NeXTWORLD* Spring 1992), there were several errors and omissions that need to be clarified.

It is possible to select only a portion of an image for scanning by using the selection tool to choose a specific scan area from the preview. The price listed in the summary box for ScanTastic with the Epson ES-300C should have read \$1795. The manufacturer of the 600ZS scanner is Microtek Laboratories, not Microtech. The list of scanners that are supported has increased to include the Epson ES-300C, Nikon LS-3510AF, Microtek 600ZS, the XRS family, and the Hewlett-Packard ScanJet IIC. And since the review was

written, the price for ScanTastic has been adjusted. Versions for the above-mentioned flatbed scanners (not including the Nikon) are \$495 each.

LANCE GILBERT
President, Second Glance Software
Laguna Hills, California

Man and market, Part II

I thought the two letters in the Spring 1992 issue regarding NeXT and Steve Jobs were valid. It is

important to understand the design philosophy at NeXT and, judging by the machine it created, it could serve as a solid example to others in this industry and other industries. Let's not make the mistake of focusing too much on the technology without focusing on why it was produced and what it was designed to accomplish.

CHRIS CUILLA
President, The Cuilla Company
Grayslake, Illinois

Canon and NeXT

Before saying anything encouraging about Canon, as you did in your piece "NeXT Goes Global" (*NeXTWORLD* Winter 1991), it is instructive to take a look at how its deal with Apple has paid off. As it is, Canon essentially has a lock on authorized Mac distribution, but it has done little to actually promote the machine. Canon makes its own computers and therefore has less incentive to sell other manufacturers' products.

Even though Canon owns a

piece of NeXT, it still will have only one-sixth the financial motivation to sell a NeXT as one of its own machines.

ADAM RICE
Austin, Texas

Vanilla review

I was pleased to see Bruce Berkoff's letter ("I didn't write that!" *NeXTWORLD* Spring 1991) about his review of Mathematica 2.0 ("Math for the Masses," *NeXTWORLD* Winter 1991). In your review you simply described Mathematica's features — most of which are common to versions on other platforms.

Why no mention that NeXT is the only workstation that supports the Notebook front end? Why not tell how easy it is to cut and paste Mathematica graphics to any other NeXTstep application? Why not describe how much easier it is for programmers to write custom front ends to Mathematica in NeXTstep than in any other development environment?

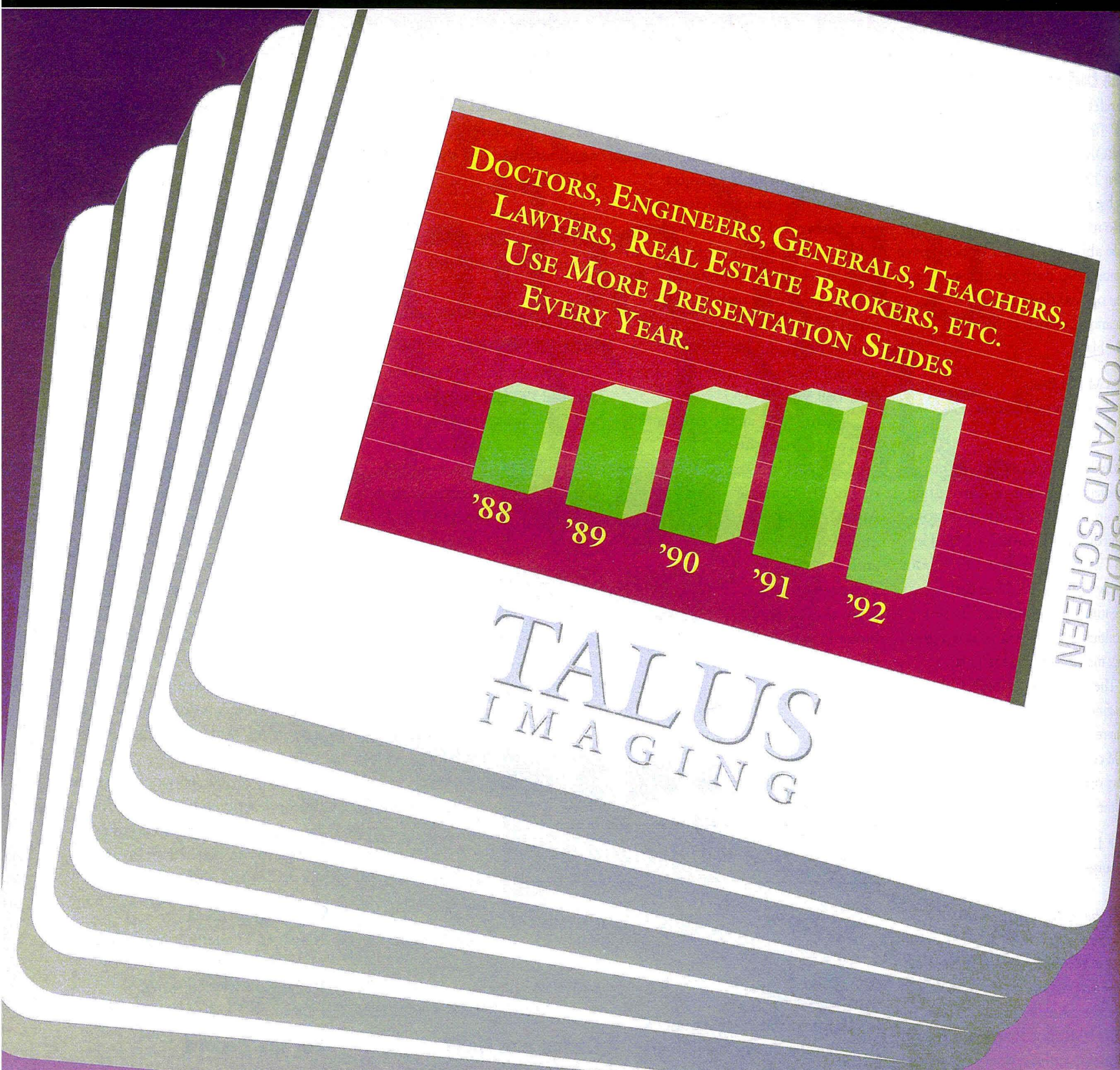
Your review fell woefully short by not describing how the NeXTstep environment allows Mathematica to run better than on any of the other platforms.

O. DAVID SPITZLER
Manager, Higher Ed. Marketing,
NeXT Computer
Redwood City, California

For the Record

In "Simson Goes to Camp" (NeXTWORLD Spring 1992), we gave the wrong location for Stepstone Corporation, owner of Objective-C. The correct address is at 75 Glen Road, Sandy Hook, CT 06482.

NeXTWORLD welcomes your comments. Please send them to Letters at NeXTWORLD, 501 Second St., San Francisco, CA 94107, or e-mail letters@nextworld.com.



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8	2	4
9	—	1
10	7	2

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- EXTENDED TEXT OBJECT
- EXPANDED MARKETING MESSAGE
- TIME-BASED MEDIA STANDARD
- NeXTSTEP PORT TO SPARCSTATION

- ITEM
- ON-LINE NeXT INFO SYSTEM
- 16-BIT COLOR UPGRADE PATH
- END-USER RELATIONAL DATABASE

- ITEM
- NeXT MARKETING MESSAGE
- 3-D GRAPHICS/ANIMATION
- INEXPENSIVE COLOR PRINTER
- NeXTWORLD Expo
- OS DISTRIBUTION VIA CD-ROM
- NeXTSTEP PORT TO INTEL PCs
- NeXT SUPPORT FOR MAC FLOPPY
- SERVICES FOR LINKING APPLICATIONS
- HYPERTEXT AUTHORIZING SYSTEM

* On Up-and-Coming list last quarter

OPENERS

TEN MOST WANTED

TWO MORE ITEMS – OBJECT LINKING AND HYPERTEXT AUTHORIZING – WENT IN THE BAG ON THE STRENGTH OF EXPO ANNOUNCEMENTS. THE MOVEMENT IN RANKINGS IS BASED ON READER INPUT.

RANK	LAST QTR.	QTRS. ON LIST	ITEM	COMMENT
1	1	4	PAGE-LAYOUT PROGRAM	Could be last quarter on list
2	5	2	JPEG COMPRESSION	Do it in software?
3	U&C*	2	SCSI OD	Third-party solution?
4	4	4	WORLD-CLASS SERVICE/SUPPORT	New pricing plan a mixed blessing
5	U&C*	2	\$99/MIPS WORKSTATION	Magic price/performance barrier
6	8	2	SLAB WITH SLOTS	Some are calling it a "brick"
7	6	3	REASONABLE RAM/STORAGE	Pricing on configured Turbos a help
8	2	4	CAD SOFTWARE	Movement from Axsys and Graphisoft
9	—	1	BETTER SYSADMIN SUPPORT	Licensing, configuration management
10	7	2	NeXT PORTABLE/NOTEBOOK	May be a long wait

UP - AND - COMING

ITEM	COMMENT
LOW-COST, ENTRY-LEVEL SYSTEM	But don't give up screen size
MULTI-USER PROJECT-MANAGEMENT SOFTWARE	Standard IPC application
CHOICE OF KEYBOARDS	UNIX users prefer the old one
BUILT-IN MIDI PORTS OR CARD	Could be a great music box
EXTENDED TEXT OBJECT	Custom apps need advanced features
EXPANDED MARKETING MESSAGE	Beyond custom apps
TIME-BASED MEDIA STANDARD	Better than QuickTime
NeXTSTEP PORT TO SPARCSTATIONS	Great hardware needs great software

STILL ACTIVE

ITEM	COMMENT
ON-LINE NeXT INFO SYSTEM	Huge opportunity
16-BIT COLOR UPGRADE PATH	Reward original buyers
END-USER RELATIONAL DATABASE	Custom apps not for everyone

IN THE BAG

ITEM	DATE REMOVED	COMMENT
NeXT MARKETING MESSAGE	Nov. 1991	Custom apps
3-D GRAPHICS/ANIMATION	Jan. 1992	3-DKit in NeXTstep 3.0
INEXPENSIVE COLOR PRINTER	Jan. 1992	NeXT Color Printer
NeXTWORLD EXPO	Jan. 1992	First of many
OS DISTRIBUTION VIA CD-ROM	Jan. 1992	When 3.0 ships
NeXTSTEP PORT TO INTEL PCs	Jan. 1992	Due in summer
NeXT SUPPORT FOR MAC FLOPPIES	Jan. 1992	NeXTstep 3.0
SERVICES FOR LINKING APPLICATIONS	Jan. 1992	3.0's object linking
HYPERTEXT AUTHORIZING SYSTEM	Jan. 1992	Craftman, HyperCube due

* On Up-and-Coming list last quarter

STREET PRICES

These are the best prices we could find, as of press time, on in-demand NeXT products. You should be able to match the price with a little shopping.

HARDWARE

PRODUCT	BEST PRICE	WHERE
NeXTstation (105MB hard drive, 8MB RAM)	\$3996	Abacus, 415/759-9508
NeXTstation TURBO (250MB hard drive, 16MB RAM)	\$5096	Abacus, 415/759-9508
NeXTstation TURBO COLOR (250MB hard drive, 16MB RAM)	\$7646	Abacus, 415/759-9508
660MB INTERNAL DRIVE	\$1185	Tecor, 408/458-3197
1.2GB INTERNAL DRIVE	\$1785	Fast Access, 708/530-7749
1.44MB FLOPPIES	\$19.75/20	Fry's Electronics, 408/733-1770
2.88MB FLOPPIES	\$59/10	NeXTConnection, 800/800-6398
4MB SIMM (monochrome)	\$110	Stratum Technologies, 800/533-1744
4MB SIMM (color)	\$120	Stratum Technologies, 800/533-1744

SOFTWARE

PRODUCT	LIST	STREET
WRITENow (Appsoft)	\$199	\$125
SOFTPC (Insignia Solutions)	\$499	\$305
WORDPERFECT (WordPerfect Corporation)	\$495	\$299
ADOBE PLUS PACK (Adobe Systems)	\$199	\$129
DIAGRAM (Lighthouse Design)	\$399	\$339
CREATE (Stone Design)	\$495	\$419
WHO'S CALLING (Adamation)	\$495	\$395

BEST-SELLERS

These are the hottest-selling NeXT products as of press time, according to NeXTConnection, a direct-marketing distribution source for NeXT products. Note that NeXTConnection handles most, but not all, NeXT products. Important exceptions include HSD's modems, scanners, and software and Stone's DataPhile and Create.

HARDWARE

- 1 CANON DOUBLE-SIDED OPTICAL DISKS (Canon USA)
- 2 PLI SUPERFLOPPY 2.88MB FLOPPY DRIVE (Peripheral Land)
- 3 DOVEFAX FAX/MODEM (Dove Computer)
- 4 2.88MB ED FLOPPY DISKS (Toshiba America Electronic Components)
- 5 16MB MEMORY UPGRADE KIT (NeXTConnection)

SOFTWARE

- 1 ILLUSTRATOR 3.0 (Adobe Systems)
- 2 SOFTPC 2.0 (Insignia Solutions)
- 3 FLOPPYWORKS (Digital Instrumentation Technology)
- 4 WORDPERFECT 1.0.1 (WordPerfect Corporation)
- 5 DIAGRAM 1.1 (Lighthouse Design)

Backup without getting TAR and feathered.



If you're tired of struggling with cryptic UNIX backup utilities, now you can back up the way NeXT™ intended you to – *easily and intuitively*. With a mere click of a button, *RunningBACK* brings you the first user-friendly, graphical interface tape archive software for NeXT computers.

Powerful features allow you to back up entire volumes or make sophisticated rule-based selections of individual files. Choose files by date, title, type, creator, or any combination of criteria. Or schedule unattended backups with convenient timer scripts.

RunningBACK's cursor sensitive help window eliminates backup frustrations

providing real-time assistance. And it's multiplatform file format will allow data interchange with Macintosh computers.*

Bundled exclusively with the Microtech Eclipse 2.0T 2GB DAT drive, *RunningBACK* provides the only fast, network compatible tape backup application for NeXT computers. Unless, of course, you prefer TAR... and feathers.

For more information on *RunningBACK* or Microtech International's complete line of NeXT storage and memory products call:

800-325-1895

International inquiries: 203-468-6223.

*Eclipse CD,
Eclipse 2.0T Tape Backup,
Eclipse internal and
external hard drives
from 200MB -1.3GB,
Eclipse 50R Removable.*



MICROTECH
INTERNATIONAL, INC.

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*Requires purchase of RunningBACK software for the Macintosh. Microtech reserves the right to change specifications without notice.

Circle 2 on reader service card

PRESS CLIPS

Denver reseller Random Access expects to do \$10 million in NeXT sales in 1992. Dale Pratt, who heads the effort, talks of a law firm that had to track 750,000 pages of documents among 16 associates. "It was cheaper to buy 16 NeXTs, with enough storage and a document-management program, than it was just to make 16 copies of the documents," Pratt says.

ALAN BRODY, *MARKETING COMPUTERS*,
JANUARY 1992

"They easily have the best CEO," says analyst [Robin] Rather. "They have the catchiest names. Now they have one of the best platforms for technical leadership."

ANDREW JENKS, *WASHINGTON TECHNOLOGY*,
DECEMBER 19, 1991

We are in the business of worrying about improved technology and the benefits it will bring to all of us who use computers. We really, really do care about whether those vendors are going to make better computers. And in that respect, NeXT is one of the few companies that has even attempted to define and build a better computer system in the past five years.

EDITORIAL IN *INFO WORLD*,
DECEMBER 16, 1991

Unlike a lot of people who think the computer industry's maturing, I think it's in its infancy. I think there are technological breakthroughs that happen once every ten years, maybe. And that those technological breakthroughs have the force to reshape the tools that we build, and to reshape the industry along with them, as certain companies pay attention to them earlier and certain companies wake up fairly late.

INTERVIEW WITH STEVE JOBS, *MICROTIMES*,
FEBRUARY 14, 1992

NEW IN SHRINK WRAP

JANUARY 1 TO APRIL 1

DTP/GRAPHICS

APPSOFT DRAW
Version 2.0 of the old
TopDraw
Appsoft
415/617-8440

PIXEL MAGICIAN
Graphics file-format
conversion
Bäachus Software
310/820-9145

CONNECTIVITY/ COMMUNICATIONS

COCONET HOST
Conferencing and
electronic BBS
Coconut Computing
619/456-2002

COMMUNICAE 2.0
Communications package
with terminal emulation
Active Ingredients
617/576-2000

CUB'X-WINDOW
X11R4 server for NeXT
machines
Cub'x Systèmes
33/146-93-29-25

DATALINK FOR ORACLE
Information retrieval for
use in Informix Software
Wingz
Fusion Systems Group
212/285-8001

EXECUTOR-XL
Mac emulator to run
Microsoft Excel
Abacus Research and
Development
505/766-9115

NeXT

By

Each issue of *NeXTWORLD*, NeXT stretchers based on great feature: chance to win a *NeXTWORLD* games begin.

This issue we look at the operator, which shows itself best in the most intriguing features of Ill shapes halfway between other shapes.

We used the Blend tool to create events by blending symbols derived. Note that we omitted pieces of events and the bicycle in Cycling.

For each event, can you figure blends combine symbols in equal halves between symbols B and the events.

SYNONYM CHAINS

How do you get from here to the saurus, you can get there by jumping here – hitherto – yet – besides – I

Your challenge is to find the six word pairs: work/play, up/down cube/sphere. Rules: For consecutive onym of the other in Digital World. Multiple-word phrases, obscene words are not allowed.

Address entries to Puzzle Editor, San Francisco, CA 94107. Or fax it to us. Write us a note about the magazine. Entries must be received by May 1992. *NeXTWORLD* T-shirt.

MIX
DSP fax modem
i-link GmbH
49/30/781-7055

CAD

VISA
DXF-to-NeXT file-format converter
Graphisoft
415/737-8665

BUSINESS

CONCURRENCE
Outline and presentation tool
Lighthouse Design
800/366-2279

DECISION BUILDER
Expert-system development kit
Marble Software Products
408/436-7299

LIVE WIRE
Productivity groupware
Adamation
510/452-5252

MV Link
Binds real-time and historical market data to NeXT applications
Market Vision
212/227-1610

S CLIPS

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MARKETING COMPUTERS,
JANUARY 1992

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STEVE JOBS, MICROTIMES,
JANUARY 14, 1992

WIN
K WRAP

1 TO APRIL 1

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Communications package
with terminal emulation
Active Ingredients
617/576-2000
- CUB'X-WINDOW
X11R4 server for NeXT
machines
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Mac emulator to run
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VISA
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- MV Link
Finds real-time and historical market
data to NeXT applications
Market Vision
212/227-1610

- SOUND
SOUNDBURSTS
Percussion and effects digital sound
collections
MIDIapolis Systems
612/822-1604
- SOUND HOUSE
Inexpensive sound recorder
MIDIapolis Systems
612/822-1604
- UTILITIES
DOTS
Printer support for non-NeXT
printers
Federico Heinz Consulting
49/30/784-9864
- ENGAGE
NeXTstep Workspace extension
Atherton Software Works
415/321-3720
- MACINDISK TOSHBROWSER
Interface to Macintosh diskettes
Impact Software Publishing
607/277-8623
- SWOOP'N
Series of business utilities
Paget Press
206/448-0845

- DATABASE
DATAFILE
Flat-file database manager
Stone Design
505/345-4800
- ELECTROFILE
Manages scanned-in document
images
Insight Software
503/222-2425
- FILEMASTER
Free-form data-management tool
Telemedia
412/321-5850
- PARABASE
Database tool set
IP Design
310/394-1820
- LANGUAGES AND TOOLS
ALBUM
Scrapbook for text, graphics, sound,
and UNIX scripts
Forty-two Software
49/40/38-19-24
- CRAFTMAN
Hypertext, scripting language, draw-
ing, and data-management environ-
ment
Xanthus International
46/8/612-8995

- D-CC COMPILER
High-performance optimizing
C compiler
Diab Data
415/571-1700
- D-F77 COMPILER
High-performance optimizing
Fortran compiler
Diab Data
415/571-1700
- DISPLAY POSTSCRIPT SYSTEM
SOFTWARE DEVELOPMENT KIT
Tools and reference materials for
Display PostScript
Adobe Systems
800/833-6687
- EIFFEL
Eiffel language compatible with
Interface Builder
Rock Solid Software Engineering
805/685-6869
- MODEL BUILDER
Object-set framework for building
simulations of complex systems
Simplex Systems
313/285-1915
- OPENADA COMPILER
Certified Ada compiler
Meridian Software
714/727-0700

- POWER PALETTES
Interface Builder object palettes
RDR
703/591-8713
- SERIAL SOLUTIONS
Interface Builder object palette with
UNIX serial drivers
BenaTong
614/276-7859
- STORAGE
ECLIPSE 1.2T
1GB DAT backup system
Microtech International
203/468-6223
- ENTERTAINMENT
Ragnarok: Twilight of the Gods
Animated strategy game
David Joerg Productions
617/493-3418

9. AE 10. FD 11. AB 12. BJ
5. DI 6. CF 7. GH 8. CJ
1. BD 2. EJ 3. FG 4. HI
Answers:

O P E N E R S

NEXT OLYMPICS

BY SCOTT KIM

Each issue of *NeXTWORLD*, NeXTGames will challenge you with brain stretchers based on great features of the NeXT environment. You'll also get a chance to win a *NeXTWORLD* T-shirt. So sharpen your pencil and let the games begin.

This issue we look at the outstanding illustration package Adobe Illustrator, which shows itself best in the pure PostScript world of NeXT. One of the most intriguing features of Illustrator is the Blend tool, which creates shapes halfway between other shapes.

We used the Blend tool to create symbols for twelve imaginary Olympic events by blending symbols derived from the 1972 Summer Olympic Games. Note that we omitted pieces of equipment such as the soccer ball in Soccer and the bicycle in Cycling.

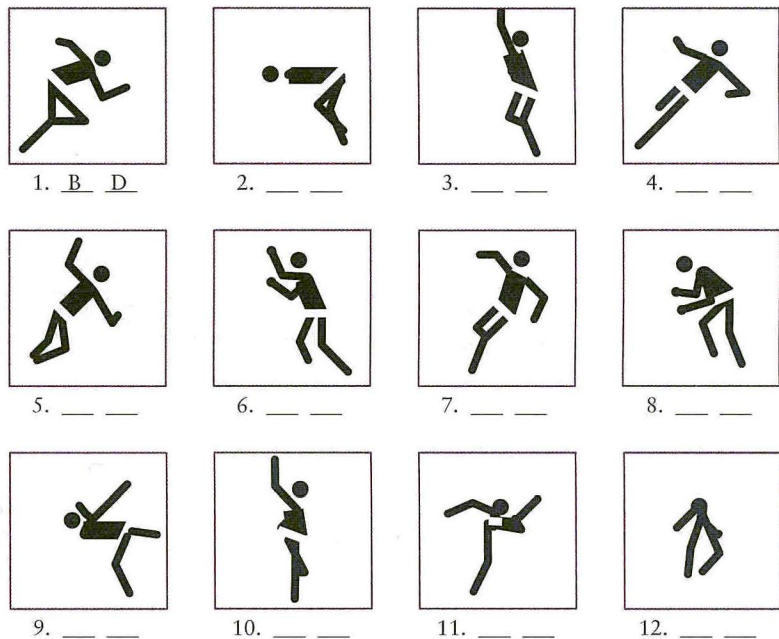
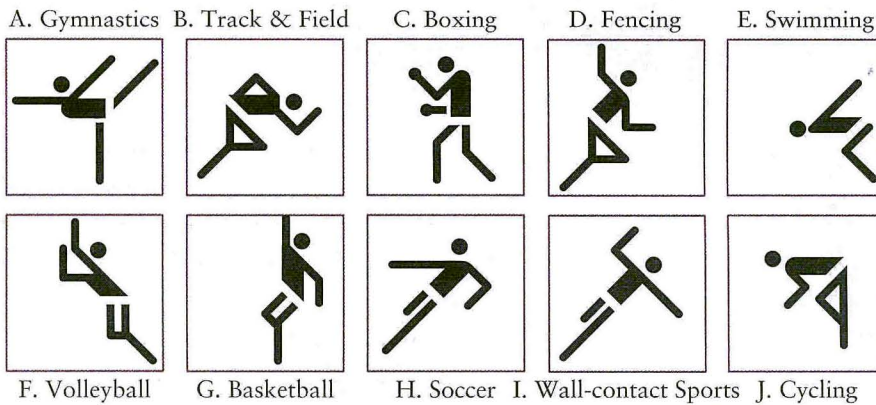
For each event, can you figure out which two symbols we blended? All blends combine symbols in equal proportions. For instance, event 1 is halfway between symbols B and D. Check your answers below. Bonus: Name the events.

SYNONYM CHAINS

How do you get from here to there? If you're using Digital Webster's thesaurus, you can get there by jumping from synonym to synonym six times: here - hitherto - yet - besides - beyond - yon - there.

Your challenge is to find the shortest possible synonym chains for these six word pairs: work/play, up/down, slow/fast, begin/end, next/previous, cube/sphere. Rules: For consecutive words, one word must be listed as a synonym of the other in Digital Webster's. Parenthetical words may be omitted. Multiple-word phrases, obscene words (preceded by an asterisk), or hyphenated words are not allowed.

Address entries to Puzzle Editor, *NeXTWORLD*, 501 Second St., San Francisco, CA 94107. Or fax it to us at 415/978-3196. And while you're at it, write us a note about the magazine, or send us your NeXTGames ideas. Entries must be received by May 15, 1992. Winners will receive a *NeXTWORLD* T-shirt.



Born to Code

Jayson Adams, the 24-year-old founder of Atherton Software Works, reclines in the chair of his tiny Silicon Valley office and talks about starting a new company. "Yeah, it's a little scary, but it's nice, too, because I can write whatever I want in terms of code," he says, laughing somewhat nervously. "That's what I love to do the most — write code."

Adams, who taught himself how to program at the age of 12, says he also has wanted to run a software company "far back as high school." When Mac software development was the hot market for enthusiastic young programmers, he was still pursuing his degree in electrical engineering at Stanford. Then NeXT came along, and he hooked his wagon to it — first as a strategic-developer engineer at NeXT, helping developers that NeXT especially wanted to see working on the platform. Last November, his entrepreneurial dream intact, he began a leave of absence from NeXT and took the plunge into business.

His goal for Atherton is a simple one: "I want this to be a small company that churns out great software. And it has to be fun. I'm only going to do it if I'm having fun doing it."

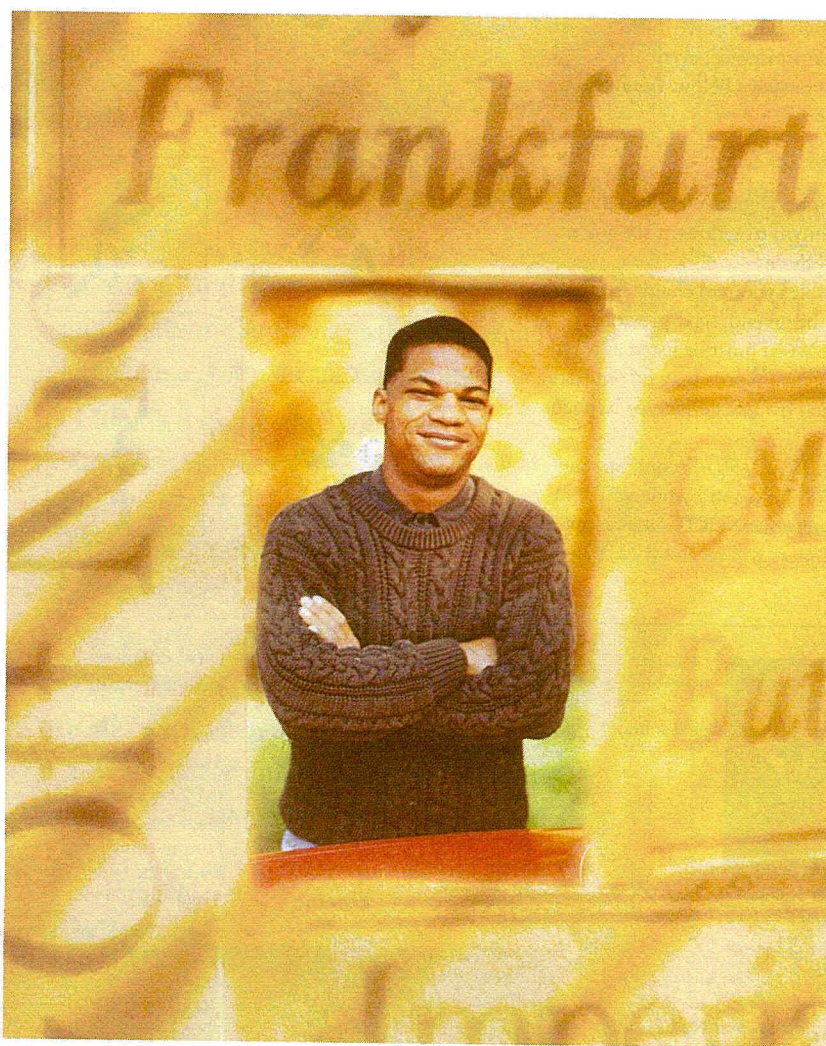
While still at NeXT, Adams created NewsGazer, an application that enables Internet-news readers to quickly access the topics in which they're interested through a simple Browser-like interface. He created it for his own use, but since he began distributing it as a freeware program, it's become a standard mode of communication within the NeXT community.

Shortly after starting Atherton, Adams set his mind to more specific information-management strategies. With more and more corpora-

tions entering the NeXT market, he realized that users would need to manage larger and larger information bases, such as live news feeds like DowVision and Reuters. Very often, this information is automatically dumped into a folder in a bookshelf and almost forgotten. How, he asked himself, can users easily access and use that data? His

to search for the right phrase, "No, filters, that access data streaming in." Adams showed NewsExplorer at NeXTWORLD Expo with a demo using a simulated DowVision news feed. The program searched for all articles relating to his keyword, "economy," then displayed them in both an indexed window and a summary window that acts like a ticker tape, displaying headlines in a stream that flows across the bottom of the screen.

With Global Information



Jayson Adams helps users get a window on the world of information.

answer took the form of NewsExplorer, a program that can be used to search for and retrieve articles from electronic feeds. Using keywords, users can then assemble the articles they're interested in.

"NewsExplorer has queries..." he pauses, as the creator of an information-retrieval system would,

Group, a small Chicago-based software developer that specializes in sophisticated news-retrieval applications, Adams has been working on expanding the software's abilities, so it can build logical arguments from models chosen by the user.

For example, he explains, a

zoologist can access a scientific research news feed and highlight articles on kangaroos. He can then indicate which articles he's interested in and tell the program to search in the future for similar articles. The software might return a statement to the screen like, "Users looking for articles on kangaroos social habits and parenting techniques." The software uses a specific keyword-based algorithm to structure that can figure out similarities between articles and then generate sophisticated query structures. "Users may not realize that certain words do a better job of describing types of articles they're interested in than words they'd think of naturally," Adams says. Those rules can be built into the software. "Having the computer do the work maximizes the results," he says.

Adams wants to also focus Atherton's resources toward helping users use information once it comes into the computer. Engage his other new application (see "Boots and Suspenders" for a review in this issue), is "a different twist to Application Dock-extended with multiple levels — it lets you create a dock to guide work flow," he says. Users can define different levels in the dock by project, time, workgroups, and can include images, text, and sound files. Adams is also working on "personal information" software and corporate-bulletin board applications.

As much as he loves to write code, Adams always keeps the goals of the user in mind: "I want to help people manage information," he says, "because everyone's bombarded with information these days. The trick is to not get overwhelmed by it." ♦

by ELIOT BERGSON

PHOTOGRAPH BY STUART WATSON

Resident

Keith Olhfs sits in his office overlooking Redwood City Marina and downtown San Francisco. These aren't just any doodles, though: they're carefully crafted a 2-bit-deep grid of 48 by 48 pixels. They're NeXTstep icons.

Olhfs is NeXT's interface specialist. As resident artist, he's designed practically all of the icons that NeXT uses. He's also responsible for a large part of the computer's distinctive look, from NeXTstep's three-dimensional controls to its anti-aliased icons that seem to

Technolo

If you ran into Sergei Moroz, you'd have thought you had a personal calling card too. The Russian entrepreneur has a logo painted on them.

In fact, the burly Russian entrepreneur is a promoter of Russia's infant personal computer industry. He's a big believer in NeXT technology.

That last role is a trifle difficult. Moroz brings home the equivalent of a fortune from his computers are impossible to buy. There are always ways around that, though. Moroz, who raised Western capital by importing and selling enamel-painted metalware, is now driving NeXT's unlikely advocacy.

Russian entrepreneur Sergei Moroz is NeXT's unlikely advocate.



C O M M U N I T Y

can access a scientific news feed and highlight kangaroos. He can then which articles he's interested and tell the program to the future for similar articles. The software might return a to the screen like, "User for articles on kangaroo bits and parenting tech. The software uses a sword-based algorithm that can figure out similarities between articles and then sophisticated query structures. Users may not realize that words do a better job of types of articles they'd in than words they'd naturally," Adams says. les can be built into the. "Having the computer do maximizes the results,"

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OT BERGSON

PHOTOGRAPH BY STUART WATSON

Resident Artistry

K eith Ohlfs sits in his office overlooking the Redwood City Marina and doodles.

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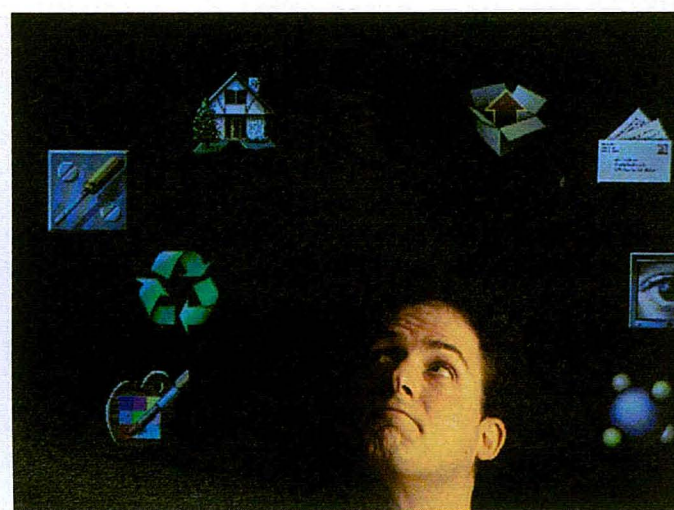
more resolution than the screen should permit. He's also worked with NeXT's designers in developing key aspects of the NeXT-dimension. And now, he's working on an exciting new crop of NeXT graphics processors.

Ohlfs first knew he was an artist back in elementary school, he says, when he won second place in a haunted house poster contest. He started playing with computer art in high school, designing the graphics for an Apple II adventure game called Super Hero. While he was earning a B.A. in illustration at San

Jose State University, one of his teachers introduced him to some people at Adobe Systems who were designing an program called Illustrator. Ohlfs joined the development team, creating images and debugging the program.

When Susan Kare, then NeXT's creative director, noticed Ohlfs's work in Adobe's advertisements, she asked him if he would like to draw some things for NeXT. "One thing led to another and in the spring of '87 I graduated and took a full-time position doing illustration and design for NeXT's software group," recalls Ohlfs.

Once at NeXT, though, Ohlfs began to program. It started with a



NeXT graphics wizard **Keith Ohlfs** lives at the crossroads of design and technology.

small program designed to show off some of the features of Display PostScript. Soon the program grew into a full application – Icon, shipped as a demo program with NeXT's system software.

"Icon was very buggy," says Ohlfs. "It crashed if you pushed the wrong button at the wrong time. It was also very unintuitive. ➔

Technology Czar

I f you ran into Sergei Morozov at NeXTWORLD Expo, you may have thought you had met a master Russian folk artisan: His personal calling cards took the form of enameled pins with the NeXT logo painted on them. He presented Steve Jobs with an enameled tray and silver urn that he made himself.

In fact, the burly Russian is the vice-chief of the communication department of the Presidium of the Russian Academy of Sciences, a tireless promoter of Russia's infant personal-computer industry, and an enthusiastic believer in NeXT technology.

That last role is a trifle difficult in a country where the average wage-earner brings home the equivalent of \$4 a month and workstation-level computers are impossible to buy because of U.S. export restrictions. But there are always ways around such inconveniences for the inventive Morozov, who raised Western capital to acquire his two NeXT systems by making and selling enamel-painted stacked wooden Matroska dolls.

Now, as part of his drive to bring Western-style personal computing to the former Soviet Union, Morozov is seeking to expand his modest NeXT installation into a full-scale NeXT distributorship for the independent republics.

*Russian entrepreneur **Sergei Morozov** may be NeXT's unlikely advocate.*



Morozov uses the NeXT machines at one of his several private ventures, Science Production Enterprises (known by the Russian initials NPP), to publish a catalog of new Russian business ventures to interest prospective foreign investors.

NPP's other NeXT project

uses the machines for high-quality document imaging of the art treasures of the famed Tretkovsky Gallery in St. Petersburg. By scanning documents and artwork that are otherwise not available for public viewing because they are so old and fragile, NPP hopes to make the works available to domestic and international art lovers by electronic display or reproduction in printed art books.

Morozov's involvement with computers began when he was working as a medical researcher in microcirculation at the Russian Academy of Sciences. In 1986, he helped install the academy's first computer network of 56 Wang computers, later replaced with IBM PCs. In the process, Morozov switched his research from medicine to microelectronics.

The new regime has not brought about much change for the average Russian citizen, says Morozov. While a skilled computer programmer may make as much as \$30 per month, Morozov says that the deficiencies of the educational system and lack of Russian software tools provide scant opportunities for native software development. Only a handful of new programs appear on the market each year, according to Morozov, and most computers are only used as word processors.

Morozov expects this will change, and he may have found a believer in NeXT CEO Steve Jobs. Recently appointed by George Bush to the President's Export Committee, Jobs has a keen interest in Russian computing. "I always felt that the Soviet Union needed computers, but I feared they would end up with MS-DOS," Jobs says. If Jobs wants to help the computer industry in Russia, he knows where to look for his first advocate. ♦

by KRISTIN DYER

Thanks to Geoffry Knauth of Marble Associates for translation assistance.

PHOTOGRAPH BY JULIE CHASE

SUMMER 1992 NeXTWORLD 11

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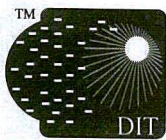
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Circle 10 on reader service card

Point of order

Change has always come slowly in the legal profession, but turn-of-the-century legal eagle Clarence Darrow walked into the offices of high-tech patent attorneys Marger Johnson McCollom & Stelowitz, he'd see plenty of it. While he might feel at home amid the clutter of briefs and documents, he'd do a double-take at the sleek NeXTstation in the corner.

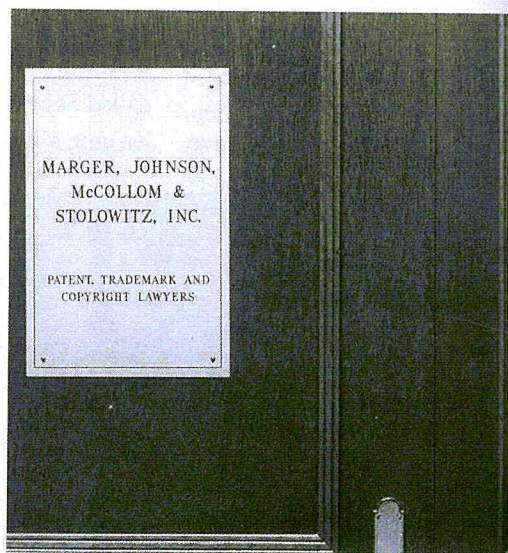
Lawyering is no longer a one-man affair; today, volumes of information must pass between a law firm's counselors and its support staff—that means having powerful computers. "Here and now, right out of the box, this machine will do more to promote connectivity within a law office than any other computer," says Alex Johnson, senior partner and co-founder of the Portland, Oregon firm. Marger Johnson has chosen the NeXTstation as its office standard, with 12 machines already installed and three more expected by the end of this year.

On the NeXTstation, Johnson can format documents without memorizing strings of complex commands. Bundled software lets him send mail and faxes to clients and co-workers with the click of a button. Johnson says in the future he plans to expand this connectivity by working on-line with clients to edit documents and by dictating documents directly into the computer.

Interestingly, it was the release of Microsoft Windows 3.0 for PCs that drove Johnson to abandon his existing base of DOS machines and choose the NeXT. "Windows 3.0 was intended to bring to DOS users what Mac users had long had," says Johnson. "We did a cost analysis of DOS machines with Windows and found that we had to go to '386 machines to make full use of 3.0." The company then considered buying similarly priced Mac IIcx's and networking them with its PCs, but found that with additional hardware and software needs, the cost would equal that of NeXT end workstations.

That's where the NeXTstation came in. Marger Johnson tried out both versions of Sun Microsystems's SPARCstation SLC and the NeXTstation, both of which cost \$4995. Johnson said that although the Sun machine was an able performer, the NeXTstation came equipped with bundled software, e-mail, and voice annotation. And the NeXT machine is poised for adding new technology as it comes along.

"What I liked about NeXT is that the hooks are there—when new technology is available, they're ready," Johnson says. Major operations such as maintaining the company's database of case and docket information, have been moved to the NeXT from DOS machines. So has all



Law firm Marger Johnson made the leap from DOS to NeXT.

→ Point of Order

of the lawyers' routine work. Many of the first NeXTstations went to the firm's higher-paid employees because they were most likely to appreciate its features for real cost savings. For example, Marger Johnson's lawyers must submit both written materials and graphics with patent applications. NeXT's operating system lets them run word processing and graphics programs simultaneously and link changes in written documents to accompanying drawings.

Lawyers also rely on programs that count billable hours and on databases that keep track of pre-schedules that, for patent renewals, may stretch as far ahead as 20 years. Some lawyers at the firm are currently using Insignia Solutions' SoftPC emulation program, allowing them to run DOS-based financial programs like Intuit's QuickBooks. Marger Johnson's lawyers are also using Lotus Improv for time cap-

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C O M M U N I T Y

the legal profession, but if Clarence Darrow walked it attorneys Marger Johnson see plenty of it. While he is a lawyer, he is also a writer of briefs and documentation in the corner. Every day, volumes of information and its support staff – and now, right out of the activity within a law firm, senior partner and



the leap from DOS to NeXT.

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ture and financial projections.

Interest in Marger Johnson's work with the NeXT has been so great that the firm helped launch a small custom-software and systems consulting firm called Inherent Technologies. The company has developed a complex vertical application that can act as a legal-docket manager, a service interface for the Lexis/Nexis legal database, and a client/server database for the legal community.

"The key for us was our own judgment that they have a winner with this machine," said Johnson. "Our feeling is that we're adopting not just an open architecture by moving into the UNIX world, but a world of open-ended possibilities." It's a world never envisioned by the likes of Clarence Darrow. ♦

by MITZI WALTZ

→ Resident Artistry

Ironically, I paid little attention to the user interface, and it shows." Buggy as it was, though, Icon was the program Steve Jobs used to wow journalists with the NeXT's color capabilities at the introduction of the '040 machines.

Ohlfs has since rewritten Icon and given it a new name: Image, which NeXT licensed to be released by Appsoft in the first quarter of 1992. Appsoft Image is a full-featured pixel editor, with retouching and blending capabilities. Its Composite Lab lets the user combine TIFF images in a compositing window, taking advantage of the NeXT's alpha channel (which can be used to assign degrees of transparency to pixels) for realistic effects. (Ohlfs used an early version of the program to combine the images on the "Plunging into Color" cover for the Fall 1991 issue of NeXTWORLD.)

Ohlfs has also written an animation program for the NeXT that is similar to MacroMind's Director on the Macintosh, but with extra punch. Among its features is an in-betweening function that automatically generates intermediate frames between two defined drawings.

These days, Ohlfs jokes that he writes programs only as a hobby, in his spare time. "Programming is an addictive disease," he says. "It's nice to have so much control over the tools that you use day-to-day, and be able to design new ones fairly quickly. But sometimes you get caught up in the design of your tools and forget about actually using them to do creative work. I'm really not supposed to be getting paid for programming; I'm supposed to be designing." ♦

by SIMSON L. GARFINKEL

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Field Reports

Hot topics and goings-on in the NeXT user community

Threads from the Net

Optical mourned. The most lengthy and noisy debates centered around the demise of the optical and its “replacement” by the new NeXT CD-ROM distribution strategy. Amid flurries of new and old OD sales (some masquerading as Cube sales), posters expressed confusion and pain; some said they felt abandoned. A straw poll of readers showed that by almost 30-to-1, respondents favored NeXT providing some way for OD customers to use their drives with new NeXT machines. Several discussed methods to implement an OD-to-SCSI

solution without NeXT's help.

★

CD-ROM jitters. In related threads, NeXT's new CD-ROM strategy came under fire. Although some posters pointed out the advantages of the media (cheap distribution costs and large storage capacity), others were discouraged by NeXT's lack of warning and the potential for future system releases to be so large that CD-ROM might be required to “see” the whole system on smaller hard-drive systems. Old OD owners were afraid the system wouldn't fit onto one OD, making the purchase of a CD-ROM drive a virtual necessity. In any case, BANG and other user groups have stepped in, promising to make Release 3.0 available on OD to any licensed customer.

★

Custom strategy. NeXT's new mar-

keting strategy based on mission-critical custom applications was hotly discussed. Some felt this was a temporary, necessary digression for NeXT to create sales. Others felt it discouraged sales of productivity apps and hurt NeXT's faithful community of longtime developers and educational users. A related thread debated the NeXT versus Sun video: Many believed it was biased and unfairly skewed toward NeXTstep, while at the same time holding that the underlying premise — NeXTstep is a superior development environment — is true and has not been trumpeted strongly enough by NeXT in the past.

★

Electronic free libraries. The NeXT archives are expanding and many other sites now have information of interest to NeXT users. Project Gutenberg will be placing hundreds of electronic books on-line over the

next few years in formats compatible with Digital Librarian. Titles currently include *Alice in Wonderland*, some Doctor Suess books, *A Christmas Carol*, the *King James Bible*, *The Origin of Species*, and writings by Einstein, Yeats, Bob Dylan, and others.

★

Journal of success. One recent poster's article, “A Day in the Life of a NeXT User,” was a compelling example of how a NeXT machine can really add up to more than the sum of its parts. Leveraged by the NeXT, this HSD salesperson described how every aspect of his daily job was made more efficient and effective through the use of NeXTmail, the Internet archives, and fax distribution of new product announcements. More stories in the future from others could make for continued good reading.

★

Rumors. The excited talk after I centered on NeXT's rumored R workstation, with several posters passing on reports that the machine will use the Motorola 88110 chip and offer built-in multiprocessing support. Base speeds of 100–200 MIPS were bandied about, with the possibility that DSP and NeXT dimension functionality might be able to run in software. The prospect of interactive Rendering on such a machine made many readers drool.

★

The dark side. There were reports of NeXTs being stolen at an increasing rate, a good sign in a twisted sort of way. Postings on the Net are helping to track down stolen machines and prevent future thieves from getting away with them.

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★

Net stats. Traffic in the various subgroups of `comp.sys.next` had reached a steady stream of about 80 messages per day, 70 percent in the `.misc` group and the rest split evenly between the programmer and sysadmin group, when NeXTWORLD Expo hit. Volume quickly rose by a factor of two or more in the period just before and after the Expo, and overall traffic was up by 50 percent for all of January and early February. There were discussions of new splinterings of the group into sections on advocacy, hardware, equipment for sale, and competition.

User Group News

Expo stats. Over 100 user groups from 33 countries were represented at NeXTWORLD Expo in January. Volunteers from around the world worked 1000 hours in 250 four-

hour shifts, in addition to 500 hours of work before the show. The United Kingdom and Japan shared awards for the most member-miles traveled to the show.

★
UK online. The NeXT User Group (United Kingdom) has begun operation of an on-line, NeXT-specific information service, known as NeXTel. The modem supports CCITT V.21, V.22, and V.22bis and V.32 data rates, as well as MNP Level 5 and CCITT V.42bis. The protocol is 8 data bits, 1 stop bit, and no parity. The number to dial is 44/844/28-660, e-mail: `uk-next-users@ohm.york.ac.uk`.

★
NeXLAW user group is forming. NeXLAW will be an electronic NeXT user group for lawyers, legal educators, and other legal professionals who use NeXT computers

in their practice and teaching of law. This e-mail group will try to meet annually at NeXTWORLD Expo, and perhaps at American Bar Association functions as well. For more information contact Gregory Miller at Inherent Technologies, P.O. Box 1357, Portland, OR 97207, or at Marger Johnson McCollom & Stolowitz, 503/222-3613. E-mail can be sent to `gam@techlaw.com` or `nexlaw-request@techlaw.com`.

★
NOIR. It means "black" in French, but it also stands for NeXT Organizations International. Formed in October, this federation of user groups had its first organizational meeting at Expo. NOIR already boasts more than 100 member groups. It provided the Expo volunteers and hosted a full-day International User Group conference at Expo. The German groups hosted a

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small get-together for European user groups at the giant CeBIT computer show in Hannover, Germany, in early March.

★

In the groups. Chris Bradley (cbradley@convex.com) is the new head of DANG, the Dallas group. George Fankhauser of the Zurich group reports that a big party called Out in the Green is planned for June 4. No laptops or pocket calcs allowed. Contact george@nice.usergroup.ethz.ch.

★

Fifth column. VATNUG, the Virginia Tech NeXT User Group, is campaigning to convince the university computer science department's PC-selection committee to choose NeXT. The committee awards the contract to a workstation vendor for the computer science department's undergrad-

uate-purchase requirement.

★

Presence at shows. The Nova Scotia NeXT Society (abbreviated as NS²) was at the Delhousie computer fair March 2-4. The Boston Computer Society held a very popular meeting at Spring Seybold in February that featured a reception by Jonathan Seybold and demonstrations by a bevy of vendors. The NeXT section of the Club Macintosh of Montreal will have a booth at the SIMM (Salon International de l'Informatique de Montréal) Computer Show on June 3-5 at the Place Bonaventure Exhibition Hall in Montreal. The SIMM show is the largest in Quebec. Contact paulhus@cs.mcgill.ca or call 514/939-0382 (message).

★

Dead cube? There were signs at the Expo that the Cube may be dying.

Upgrade paths for future NeXT products were hinted at but not promised, and faithful customers were worried. NeXTdimension customers are especially outraged since ND went up in price, and only boards (not ND systems) are now being sold. Without a daughter-board for compression, and no announced future, ND seems like a dead end (one long thread even explored NeXTstation Color boards as a Cube color upgrade alternative). Many posters were upset, especially about NeXT's refusal to say anything definite.

★

Vision in black. One developer, worried about the above issues, yet taken by the enthusiasm of the Expo, wrote and performed a song during Expo that was later recorded by Nathan J. and the NeXTsteps on a nearby NeXTstation. It recounts the excitement

and occasional dangers of being a NeXTstep man and a NeXTcub guy." Copies of the 8-bit NeXT sound were placed on the archive by this author and a new News-Grazer posting contained shell-file Icons that when double-clicked automatically downloaded the sound from the archives, dearchived it, and then opened the lyrics and credits in Edit while playing the sound on the NeXT. The artistic merits of the song were a matter of some debate, with professional songwriter John Penn Barlow offering a scathing comment. ♦

by CHARLES L. PERKINS & DAN LAVIN

NEXTWORLD

NEWS
IN BRIEF

Two formidable NeXT competitors in the workstation market have recently combined operations to bolster the strength of the Advanced Computing Environment consortium. MIPS Computer Systems and Silicon Graphics announced an agreement to merge companies. "By joining with MIPS, we will pool the world's most talented computer scientists to continue delivering the industry's best RISC architectures," said Silicon Graphics CEO Edward McCracken. SGI will absorb MIPS's sales and manufacturing functions, while a new subsidiary, MIPS Technologies, headed by Robert G. Miller of MIPS, will focus on research and development.

NeXT CEO Steve Jobs was recently named to *Fortune* magazine's National Business Hall of Fame for his role in founding the personal computer industry at Apple Computer. Hall of Famers include Wal-Mart's Samuel M. Walton, William G. McGowan of MCI, and Max DePress of Herman Miller. The list was published in *Fortune's* March 23 issue.

Federico Heinz Consulting is shipping a new version of Dots, its non-PostScript printer driver. The new version includes support for color printers such as the Hewlett-Packard PaintJet. The new color driver will sell for \$199. The monochrome version will still be priced at \$99. Federico Heinz Consulting: 49/30/784-9864 or e-mail at federico@heinz.in-berlin.de.

i-link GmbH in early March released MIX, a communication system. Combining fax, modem, and programmable voice mail/telephone control, the hardware/software combination sells for between \$450 and \$750, depending on configuration. [CONTINUED ON PAGE 4]

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NEWS IN BRIEF

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CeBIT draws biggest-ever NeXT crowd

by DAN LAVIN

Hannover, Germany – NeXT Computer’s booth at the recent CeBIT Computer Fair here drew huge crowds, as a slew of both U.S. and European developers took the stage to demonstrate new NeXT products. CeBIT is the world’s largest computer trade show, this year drawing over 600,000 attendees. NeXT estimates that at least 20,000 of them spent time in the NeXT booth, the largest group of people ever to view NeXT machines. The figure does not include the crowds in 12 other booths that showed NeXT products. [SEE CEBIT, PAGE 20]

Mesa reads 1-2-3 files, macros

by SIMSON L. GARTFINKEL

Boston – Mesa, a traditional spreadsheet that will read and write Lotus 1-2-3 files and execute 1-2-3 macros, will enter beta testing in May, according to David Pollak, president of Athena Design and the program’s author. The program can evaluate both 1-2-3 and Excel-style formulas, draw bar graphs, and it has phenomenal recalculation speed. An early version of the program viewed in January could perform in excess of 15,000 cell recalculations per second. The program could further display multiple windows (views) for a single spreadsheet, and support drag-and-drop interaction for color, fonts, and graphics. Cambridge, Massachusetts-based Athena showed Mesa at the February meeting of the Boston Computer

Shakeup in Europe

by DAN LAVIN

Hannover, Germany – The dust is still settling on a massive reorganization of NeXT’s European operations, whose casualties include many of NeXT’s top management abroad and NeXT Europe’s headquarters in Sophia Antipolis Cedex, France. The ouster of Theo Wegbrans, NeXT Europe president and general manager, is related to poor European sales in the third and fourth quarters. But evidence suggests that NeXT executives were caught by surprise at the scope of the difficulties in NeXT Europe. Paul Vais will succeed Wegbrans as acting vice-president of NeXT Europe, according to a company spokesperson. Vais was formerly the head of NeXTedge, NeXT’s post-sales support organization, in its Redwood City,

California, headquarters. Vais has also been elevated to the policy team, NeXT’s executive operational body. There will be no president of NeXT Europe, reflecting its new status as more of a sales and marketing organization than a separate business operation. The Sophia headquarters will close in the next few months, and new headquarters will open in Paris, NeXT said. Its marketing employees will be offered transfers to the United States, where they will be integrated into the marketing group to “help globalize NeXT headquarters and integrate Europe into the company,” said Vais. NeXT also fired Richard Strong and Jean-Jacques Mau-

NeXT overhauls European operations

- Wegbrans ousted
- Vais appointed acting VP
- Sophia headquarters closed
- U.K., France country managers removed
- Dealer strategy revamped

cuer, country managers of the United Kingdom and France, respectively. Duco Sickinghe was transferred from vice-president of marketing for Europe to acting

country manager of France; Dieter Hüttenberg has gone from director of higher education to country manager of Switzerland; Stuart Marvin has moved from his position as multicountry manager to country manager of Italy; and Gregor Bailar moved from head of the European support team to head of the U.K. operation. The only country manager left in place is Helmut Blank of Germany, which has the strongest performance in Europe. Demand creation is the key to NeXT’s new European strategy. NeXT itself [SEE EUROPE, NEXT PAGE]

MIPS fall where they may

by LEE SHERMAN

In the never-ending race for workstation price-performance, NeXT holds an advantage with its current product line, but analysts warn that the



company will have to move to RISC technology to keep up with increasingly aggressive competition. As with high-performance race cars, workstation performance is typically measured by raw speed. But in NeXT’s case, that’s not enough. Even without a RISC (reduced instruction set computing) chip, NeXT systems offer the best price-performance ratio of its workstation competitors, with \$200 per MIPS (million instructions per second) for the NeXTstation Turbo. “NeXT has put together a workstation-class package that includes a multitasking operating system, integrated communications, and a high-resolution display, and it is putting it out at a PC price,” [SEE MIPS, NEXT PAGE]

NeXT names new president

Redwood City, CA – NeXT CEO Steve Jobs has named British telecommunications executive Peter van Cuylenburg president and COO of NeXT Computer. The 43-year-old former CEO of Mercury Communications will share the newly created

“office of the president” with Jobs, who will remain chairman and CEO. Jobs and van Cuylenburg will share day-to-day management of the company. Prior to joining Mercury, van Cuylenburg worked for 16 years at Texas Instruments.

ANALYSIS

Higher ed still a NeXT priority

Despite NeXT's push to broaden its commercial market, higher-education marketing efforts are still going strong.

by JONATHAN LITTMAN

Emerging new commercial markets have caused some observers to question whether NeXT is wavering from its original goal of producing a superior higher-education machine. But educators, NeXT executives, and industry watchers say that the broadening markets are critical to NeXT's continued success in the educational market. And they add that despite naysayers, NeXT's marketing efforts in higher education are stronger than ever.

The numbers bear out those claims. Twenty of the top forty North American NeXT sites are universities, according to a 1992 *NeXTWORLD* survey that excludes government sites. About one-third of all NeXT machines are installed in universities, according to NeXT. Today, 20 to 25 percent of all new NeXT sales are to higher education.

The current ratio is similar to that which Apple and Sun sell to higher education, one that NeXT believes is ideal for seeding the fertile grounds of higher education while maintaining the commercial profit margins necessary to offer deep university discounts. "The reality of the world today is that higher education can't get our best pricing unless we are successful in selling to other markets," said Ronald Weissman, NeXT's director of strategic marketing. "It's no accident that we were able to get our prices down from \$6500 in 1988 to less than \$4000 today. We've done it by broadening our markets."

Most educators agree that there are practical advantages in increased commercial sales. "The more boxes out there, the better," said John Link, professor of art at Western Michigan University. "It just gives us more software to choose from."

NeXT sells to more than 300 universities, many of which serve as hubs that sell NeXTs to smaller local universities or colleges, bringing the total number of official NeXT campuses to more than 450. Distribution depends on the campus's preference. At some universities, NeXTs are distributed directly by the institution; at others, faculty, students, and administration buy NeXTs from the campus computer store.

Last year, Massachusetts Institute of Technology was NeXT's largest educational reseller. NeXT ranked Number 2 to Apple, selling 120 workstations to IBM's 90, although still a distant third to Apple's 2200 Macs. "NeXT coming from nowhere has really done quite a job," said Jeff Solof, manager of MIT's computer store in Cambridge.

Ask NeXT how it sells to higher education, and the answer is Mathematica, Mathematica, Mathematica. "We continue to be the best machine for Mathematica," said David Spitzler, manager of higher-education marketing. "We're making sure people continue to know Mathematica is the best thing since sliced bread."

NeXT has continued bundling the sophisticated mathematics and modeling program with every workstation sold through the education channel. It also works closely with Wolfram Research, and attends Mathematica conferences and seminars. The investment pays off, because Mathematica is more than a math program. Educators are expanding the versatile program's use beyond traditional mathematics to economics, statistics, psychology, and a variety of other disciplines.

Mission-critical applications

But while Mathematica has been a constant in higher-education marketing, one of the latest developments reflects commercial trends. Many new sales are being generated by the ease with which educators are developing custom NeXT applications, much as their counterparts are doing in business.

"Mission-critical applications are not suited only to financial services or government," said Spitzler. "At many universities, faculty are using NeXTstep to write programs or utilities in a day to illustrate a concept on the screen quickly. They might be preparing a lesson,

a lecture, or a presentation." Often professors deploy their custom apps with standard applications, the most common being Mathematica, FrameMaker, and Improv.

That same need for integration is finding its way campuswide, as many universities are learning from the business world and adopting NeXT for traditional office automation. Beyond these core markets and the traditional disciplines of math, computer science, engineering, physics, and English, markets are emerging in speech and hearing, language, chemistry, biology, and psychology.

NeXT's allegiance to higher education isn't hurt by the fact that Weissman was NeXT's former director of higher education, and he hasn't forgotten his, and NeXT's, roots: "If you are looking at where we are spending our time, higher education gets a fair or fairer share than any other market."

Finding the purse strings

Efforts increasingly have focused on reaching the departmental buyers who make up the higher-education market. Last year, NeXT attended only two major education conferences; this year it plans to attend six or eight, many in new fields. A close relationship with publisher Addison-Wesley, which sponsors many of the conferences, is part of the strategy.

"We need to reach the people making the purchasing decisions in higher education," said Spitzler. "Increasingly, those decisions are being handed down to the department chairman."

An education for NeXT

Higher education as percentage of NeXT's installed base:	33 percent
NeXT sales to higher education	20 to 25 percent
Number of universities reselling NeXT machines:	300
Number of universities officially using NeXT machines:	450

Source: NeXT Computer

Lately, some of the evangelizing has come from the universities themselves. "Six months ago, NeXT had to be the advocate," said Spitzler. More recently, some universities have volunteered faculty eager to demonstrate their achievements to new higher-education users. It is a potent cross-fertilizing that NeXT believes cements existing sales and seeds new ones.

Still, NeXT isn't counting on immaculate conception. "They give you a heck of a lot of attention," said Western Michigan University's Link. "The technical help from the regional technician has been terrific. If he says it will work, I believe it will work. We've been able to make a number of purchasing decisions because we can trust what he says."

NeXT's volunteer campus consultants provide project-based technical support and guidance. "It's important for us to have people who can add value locally," said Weissman. "At many of our best accounts where we've got exciting projects or quality research going on, we have students who understand that NeXT technology helps the campus achieve its goals."

Twice a year, 6000 subscribers receive *NeXT On Campus*, a company publication that highlights university application stories. Campus resellers receive a monthly update from NeXT on new products, prices, and policies. NeXT also tries to provide personal attention for the resellers. "We try to work with the resellers on pricing and promotions," said Kathi Kaplan, higher-education channel manager.

Superior technology, of course, has long been NeXT's marketing draw, and the company's executives say the following six to nine months will see a new emphasis on high volume and multimedia data applications for higher education. NeXT, as the searching engine for wide ranges of information networks, promises to not only be a significant draw for higher education, but for business as well.

But despite NeXT's technology edge, industry watchers say price sensitivity will remain critical, even if the economy picks up. "The amount of money universities had [available] to invest has dried up," said Michael Roberts, vice-president of networking at Washington, D.C.-based Educom, the nation's leading educational consortium on information technology. "Higher education has deployed several million PCs. It's not the first time around anymore." ♦

MIPS [CONTINUED FROM PREVIOUS PAGE]
said Nina Lytton, editor of the *Open Systems Advisor* newsletter, based in Boston.

Recently, however, other workstation vendors, such as Sun Microsystems and Digital Equipment Corporation, have also lowered their MIPS prices in an attempt to attract traditional PC buyers. In the low-end market, Sun's SPARCstation ELC offers 21 MIPS for \$4995, or \$238 per MIPS. The HP Apollo 9000 425e operates at 15 MIPS, for a rate of \$366 per MIPS, while the DECstation 3100 offers 15-MIPS per-

formance for \$4995, or \$333 per MIPS.

"The old rule used to be that every year you have a doubling in MIPS and a halving in price, which is a fourfold increase," said David Evancha, director of research at Workgroup Technologies of Hampton, New Hampshire. "Recently, prices for workstations and products that have workstation capabilities have driven the price per MIPS way down."

NeXT also compares favorably on the higher end. In his *NeXTWORLD* Expo keynote, NeXT CEO Steve Jobs compared

the per-MIPS price of NeXT machines and Sun workstations. The monochrome NeXTstation Turbo configured with 16MB of RAM and a 250MB hard disk, which carries a list price of \$6995, has a price of \$280 per MIPS. The Sun SPARCstation IPX, operating at 28.5 MIPS, is priced at \$421 per MIPS. The NeXTstation Turbo Color is \$540 per MIPS, compared with the color SPARCstation 2, which has a cost of \$721 per MIPS.

But most industry analysts contend that the juice has been squeezed out of the 68000 line,

and that in order to continue lowering its price-per-MIPS ratio, NeXT eventually will need to switch to a RISC processor.

Europe

[CONTINUED FROM PREVIOUS PAGE]
will take primary responsibility for developing demand for products whether they are sold directly to customers or through dealers. Dealers that do not add value or demonstrably create demand on their own may lose their certification in the coming months, according to the company. The dominant tactic will be co-selling,

"RISC price-performance is coming down so fast, NeXT is not going to be competitive unless it moves to RISC," said Lytton. ♦

with NeXT and dealers selling to accounts together.

Vais will reshape the efforts of his staff toward these new goals. "You can't do anything, even the wrong thing, for 18 months and not build some valuable partnerships," said Vais. He plans to "orient the staff from selling to resellers to selling to customers with resellers." ♦

Appsoft



by CLAIR WHITMER

Palo Alto, CA

—If its current plan to ship four products by the end of the year is carried through, Appsoft may soon be ready for prime time. The strategy calls for the \$395 App-

Adams hopes for

Having already pumped \$400,000 into its NeXT-only publishing venture, Appsoft is pursuing a strategy that may produce some profits by the summer. Along with a business plan based on initial funding of \$1 million—including \$500,000 out of company President Randy Adams's own pocket—the company is pursuing negotiations with a venture-capital firm for additional investment, as well as possible software bundling deals with NeXTstep '486 OEMs.

Adams said he originally planned to attract \$5 million, but after doing the rounds of venture-capital firms, he scaled down his expectations. The company is shipping only about 100 to 150 copies of WriteNow a month, but plans to ship

NPA evokes

by CLAIR WHITMER

A light is appearing at the end of the tunnel as RightBrain Software and Pages plan summer delivery of their NeXT publishing programs.

RightBrain's PasteUp combines techniques of a structured document approach, like FrameMaker with a pasteboard approach, like Aldus PageMaker or QuarkXPress on other platforms. RightBrain expects to deliver PasteUp in Jun-

As NeXT continues

Customer

Williams Telecommunications
Tulsa, Oklahoma
Fiber-optic R&D

Trimark Financial
Toronto
Mutual-fund trading

custom apps with standard faker, and Improv. swide, as many universities or traditional office automa- nes of math, computer science, speech and hearing, language,

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Source: NeXT Computer

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N E X T W O R L D E X T R A

Appsoft plans blitz



by CLAIR WHITMER

Palo Alto, CA - If its current plan to ship four products by the end of the year is car-

ried through, Appsoft may soon be ready for prime time. The strategy calls for the \$395 App-

soft Draw package to ship this month, delivery of a revamped Appsoft Image and the recently licensed Personal Information Manager by the fall, and a major upgrade of WriteNow this summer, said President Randy Adams.

Appsoft has licensed technol- ogy from an unnamed company in San Diego to build image-pro- cessing technology into Appsoft Image, leaving little of the origi-

nal Pixelist code from NeXT.

The delay caused by the rewrite, however, may push the product past its 30-day NeXT- step 3.0 deadline and allow NeXT to license Pixelist technol- ogy to other developers.

The company has also licensed Personal Information Manager from Forty-two Soft- ware, of Hamburg, Germany, and plans to ship it in August. The package includes a scheduler, contact manager, and Mac-to- NeXT ASCII and TIFF convert- ers. It will cost about \$150.

This will be followed by a major upgrade of WriteNow that will incorporate the feature set of WriteNow 3.0 for the Mac now shipping from T/Maker. The appli- cation will include better color and footers control, as well as more import/export and drag-and-drop capabilities. The company is also developing a version of the word processor for the Intel platform, slated for release in September.

Adams said Appsoft is also looking at the spreadsheet and flat- file database categories and is con- sidering developing a connectivity product that will transparently support NeXTmail capabilities on other platforms, such as the Mac.

In the meantime, Appsoft is not going to publish the Oscar animation package obtained through a nonexclusive deal with NeXT, according to Adams. ♦

Ditek readies NeXT port of DynaCADD 3-D software

by DAN LAVIN

Hannover, Germany - NeXT has gained another CAD vendor to boost its move to enter the tradi- tional technical workstation mar- ket. At the annual CeBIT show here last month, Ditek Interna- tional announced it will release its DynaCADD 3.0 product on the NeXT by the fourth quarter.

DynaCADD, to be priced between \$1000 and \$1500, will combine 2-D and 3-D functions. Unique to the NeXT version will be full use of NeXTstep 3.0's RenderMan libraries.

The software joins Spatial Tech- nologies' ACIS and AutoCAD's TopCAD in a rush of recent CAD announcements for the NeXT. DynaCADD also will add Mac and Windows versions to its market- leading Atari and Amiga products.

Ditek President Oren Asher said he has wanted to develop for the NeXT machine since it was introduced, but waited until

he received assurances from NeXT that his product would receive full support from the company. After refusing for two years, NeXT recently signed a written contract with Ditek, promising undisclosed commit- ments in return for the port, according to Asher.

Asher called the NeXT machine an excellent graphic system, and said he is hopeful that NeXT may come out with a RISC machine. "We're already 14 times faster than AutoCAD," he said. "I hope [NeXT] moves to RISC. Then we'll be really fast."

Ditek has sold 10,000 units of DynaCADD since 1985, with 30 percent in North America and most of the balance in Germany, where Amiga and Atari flourish. Also shipping this fall, according to Asher, will be 10 to 15 third- party products taking advantage of DynaCADD's open, extensible architecture. ♦

Adams hopes for profits by fall

Having already pumped \$400,000 into its NeXT-only publishing venture, Appsoft is pursuing a strategy that may produce some profits by the summer. Along with a business plan based on initial funding of \$1 million - including \$500,000 out of company President Randy Adams's own pocket - the company is pursuing negoti- ations with a venture-capital firm for additional investment, as well as possible software bundling deals with NeXTstep 486 OEMs.

Adams said he originally planned to attract \$5 million, but after doing the rounds of venture-capital firms, he scaled down his expectations. The company is shipping only about 100 to 150 copies of WriteNow a month, but plans to ship

roughly 160 units of Appsoft Draw its first month and 370 copies of Image. "We think Image is going to bring us into profitability," he said.

Adams still anticipates a "negative burn rate of about \$50,000" per month for the rest of this year. In light of this, the company has entered a belt- tightening period. Once it turns the profitability corner, the company plans to create an in- house engineering department.

The company's business plan predicts a NeXT installed base of 1 million units by 1995. The company is committed to a NeXT-only strategy through 1992, but Adams said it will consider porting its products to other platforms if profits haven't materialized by then. - by Clair Whitmer

NPA evokes mixed developer reactions

by CLAIR WHITMER

A light is appearing at the end of the tunnel as RightBrain Software and Pages plan summer delivery of their NeXT publishing programs.

RightBrain's PasteUp combines techniques of a structured docu- ment approach, like FrameMaker, with a pasteboard approach, like Aldus PageMaker or QuarkXPress on other platforms. RightBrain expects to deliver PasteUp in June.

Pages is targeting August for delivery of its still-unnamed page- layout product, about three months later than originally planned.

In the meantime, NeXT is continuing to promote its NeXT Publishing Alliance (NPA) to third-party developers. The NPA is developing modular solutions based on such technology as the Archetype document engine.

RightBrain President Glenn Reid, however, dismissed the idea

of marketing application modules based on technology from com- peting developers. Such technol- ogy would need to be in the system software to be useful, he said.

Reid added, however, that if NPA eventually comes up with "something interesting," Right- Brain would consider supporting it.

Pages isn't an official member of NPA, but is "in the thick" of the discussions, said Bruce Webster, director of R&D. ♦

NeXT gets Informix RDBMS

by DAN LAVIN AND LAURIE FLYNN

Hannover, Germany - Informix Software hopes to expand its presence in the NeXT market with the recent announcement of a version of its relational database-management system for the NeXT machine.

Informix-SE (for standard engine) Release 4.1 is an SQL- based system for use mainly in front-end applications in small- to medium-size installations. The company has also ported to the NeXT its front-end database tools, which include Informix- Net, C-ISAM, Informix-4GL, and Informix-SQL.

Informix already offers its Wingz spreadsheet for the NeXT.

"Being sophisticated multime- dia workstations, NeXT comput- ers are an ideal front end for all kinds of database-access applica- tions," said Tim Shetler, vice- president of database engines and connectivity products at Informix, whose U.S. headquarters is in Lenexa, Kansas. "The new port is part of our strategy to support all major hardware platforms based on industry standards," he added.

Announced at the recent CeBIT show here, the port of Informix-SE was driven by NeXT's successes in the German market. "When NeXT went to 5000 to 6000 machines in Ger- many, it was worthwhile to do things," said Werner Niebel, director of marketing for Infor- mix Germany. With NeXT's new emphasis on custom applications, "NeXT now has a different footing in Europe and suddenly has a different approach that made development worthwhile," he said.

The price of the product will depend on configuration and sys- tem class. A developer system will cost about \$3600, with end- user versions ranging from one- third to one-half that price. The engine will be accompanied by Informix's Rapid Development System, 4GL, SQL 4.1, and debugger. ♦

Sales Watch

As NeXT continues to gain market share, we'll keep track of some large recent purchases.

Customer	Application	# of Units	Major Software
Williams Telecommunications Tulsa, Oklahoma Fiber-optic R&D	Custom software development and office automation	250 (150 installed to date)	Improv, Who's Calling, WordPerfect, Illustrator
Trimark Financial Toronto Mutual-fund trading	Accounting, office support, mutual-fund client services	100	Custom Oracle tools package, Diagram, WriteNow, Improv

B R I E F S
Continued

i-link: 49/30/781-7055 or
e-mail at info@ilink.de.

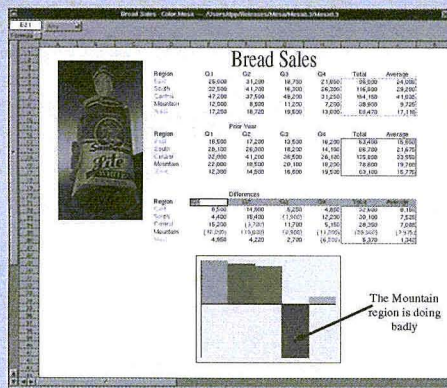
CuillaMartin Company, of Grayslake, Illinois, has announced the CuillaMartin Calculator Set Version 1.0. The software includes Basic, Scientific, and Conversion calculators. The most sophisticated calculator of the set allows for conversion among units in several categories of weights and measures. The calculators are scheduled for release this month. The price of the set had not been determined at press time. Cuilla-Martin: 708/223-5164.

Gary H. Moore, NeXT's vice-president of law and business development, and the company's general counsel, has resigned from NeXT to return to his former San Francisco law firm. He will continue to represent NeXT as outside counsel with McCutchen, Doyle, Brown, & Enersen. Moore said he hopes to make McCutchen the leading Bay Area law firm for intellectual-property litigation.

Goldleaf Publishing announced development of a compound document processor for the NeXT, called Collage. The software will integrate word-processing and page-layout features, and is based on the Archetype publishing engine. The company declined to provide pricing for Collage, which will be available in the second quarter. The Larkspur, California, company also revealed it will distribute Polaroid Digital Palette film recorders and the ScanView ScanMate desktop drum scanner from ScanView A/S of Denmark. Goldleaf is developing NeXTstep interface software for the scanner, which it will sell separately. Goldleaf: 415/257-3515.

NeXTWORLD Extra is a supplement of *NeXTWORLD* magazine. It is published monthly by Integrated Media, a subsidiary of IDG Communications, 501 Second St., San Francisco, CA 94107, and is distributed free to subscribers of *NeXTWORLD*. Lt. Sullivan's column and articles about unannounced NeXT products are reported and written by contributors without guidance from the *NeXTWORLD* staff.

Editor: Dan Ruby; **Executive Editor:** Laurie Flynn; **News Editor:** Dan Lavin; **Staff Writer:** Simson L. Garfinkel; **Layout Chief:** Sue Troy; **Copy Editor:** Eliot Bergson



Mesa can display multiple windows for one spreadsheet and supports drag-and-drop interaction for color and graphics.

Mesa [CONTINUED FROM PAGE 17] with Mesa" as soon as the program can evaluate Lotus 1-2-3 macros. The first release of Mesa will be feature-for-feature compatible with Lotus 1-2-3 Release 2.0.

"These firms have millions of dollars invested in 1-2-3 spreadsheets and are not interested in fundamental paradigm shifts," Pollak said. Improv, Lotus Development Corporation's spreadsheet for NeXTstep, has no macro language.

"The market has had an unfulfilled need for a standard-paradigm spreadsheet ever since

lak has developed a user interface for Mesa specifically designed for NeXTstep that has the "look and feel" of other NeXTstep programs.

"There's a specific reason for not having the slash commands: It may violate the Lotus user-interface copyright," said Pollak. "I'm doing everything possible to stay away from infringing on anything that may be their intellectual property."

Mesa will probably cost between \$349 and \$599, Pollak said. The program may be sold by Athena Design or licensed to another NeXTstep software firm.

Ashton-Tate ax-murdered Power-Step," said Bruce Henderson, NeXT team leader at San Diego-based Pages and one of the original developers of the Ashton-Tate spreadsheet.

Although it will be compatible with Lotus 1-2-3, Mesa does not use 1-2-3's menu structure or command language. Instead, Pol-

CeBIT

[CONTINUED FROM PAGE 17]

Alexandra von Grass, marketing communications manager for NeXT, described interest in NeXT at the show as "overwhelming." Helmut Blank, NeXT's country manager in Germany, said it served as "a validation of the interest in our vision."

That vision is embodied in two major marketing strategies announced by NeXT CEO Steve Jobs just two months ago at NeXTWORLD Expo: mission-critical custom application development and globalization of programs. Both strategies were evident in new products at the show.

• In Europe, NeXT value-added dealers are creating custom applications both for specific customers and for sale to the public. Among these are Viva, a package of Sybase-backed customizable office-automation modules from dealer D'Art GmbH. D'Art is also producing an electronic version of the standard Duden German dictionary. German dealer Gecos is developing Scout, a system and database for managing images.

• In desktop publishing, Networx GmbH showed Color-X-10, the first solution to manage the connection between a Canon

Color Laser Copier and the NeXT. The product supports the non-Postscript IPU-10 RIP, allowing fast SCSI connection to the copier.

• Unterecker Software announced Compose in Color, an image-manipulation tool with a scripting language. AMG debuted Avant Vector, an image-tracing tool that vectorizes TIFF images for manipulation in other programs. Gecos GmbH's StarTool and LaserBeam handle the interface between the NeXT machine and Agfa and Linotype imagesters. And tms GmbH showed an early version of Cranach, the company's planned page-layout and image-retouching system.

• In databases, IMS GmbH, a dealer from the former German Democratic Republic, introduced IDBM 1.5, a multimedia database. BKS billed its upcoming Poet as the first true object-oriented database for the NeXT platform.

• Fully localized German versions of Lotus Improv, WordPerfect, Diagram, and Adamation's Who's Calling were on display and are now available.

"The difference between this year and last is that instead of saying 'It's coming,' we're saying 'Buy it today,'" said NeXT's Blank.

Sully ponders new ports in the storm

After his run-in last time with a suspicious Agency bureaucrat, Sullivan asked his field agents to file their reports early. He wasn't sure how long he could keep the NeXT operation hygienic. Now, as he took a limo to Dulles to meet an operative, he glanced through the intelligence.

Most intriguing were the reports about new discussions on porting NeXTstep to other architectures. Sullivan was fascinated to read that SPARC is not being actively considered in the latest rounds of these talks. Rather, it's Hewlett-Packard and even Atari that are being courted. HP's Snake line would make a very nice host for NeXTstep (much to SunSoft's likely chagrin). Atari, on the other hand, is less obvious to UNIX observers. Did you know that Atari's 68030-based product line is beginning to nip at the heels of high-end Macintoshes... and at half their price? Did you know as well that 68040-based products due this fall will list for one-third the price of Apple's Quadra line? Shrinkwrapped NeXTstep for HP and Atari machines would make sense for several markets that are currently under-served.

Other operating system progress at NeXT is not moving along quite so smoothly. NeXTstep 3.0 beta CD-ROMs have been delayed again. If you are trying to plan your development efforts in advance, Sully is guessing the end of April or first week of May for your first CD-ROM. Consider shipping NeXT a spare hard drive instead, but keep in mind that they have their hands full these days.

Stone Design had to tap NeXT a couple months ago, just before sales of DataFile became brisk. (Compaq even bought a few copies recently.) It took a little convincing to get NeXT to fix some serious bugs in its proprietary B-tree package. An earlier B-tree release relied on a file-locking algorithm, a necessity in a multiuser database package, that simply did not work. Stone managed a temporary local fix, but finally convinced NeXT to fix the root problem.

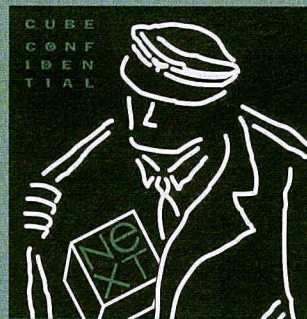
DEC gave its best shot to convincing NeXT to use its hot new Alpha chip for NeXT RISC products. Reportedly, the chip's high price tag was the sticking point, but Lt. Sullivan suspects the entrenched progress of a certain other architecture just proved to have too much momentum.

If you are considering becoming a registered NeXT developer, Sullivan advises you move quickly in obtaining and filing your application. Word inside NeXT is that the NeXT Registered Developer Program is likely to be completely

revamped later this spring. Almost certainly, this will mean additional costs associated with being a NeRD. Like refinancing your house, you don't want to wait until it is one day too late.

The Canadian tundra has become a battleground as NeXT and Sun slug it out over a potentially large (400-plus) workstation installation in Alberta. At the time Sullivan filed his dispatch, Sun Canada did not know it had lost the sale, which is unfortunate for them. Only this past January, Sullivan's counterpart Raymond Rank of SunWorld magazine, reported that Sun Canada was targeted to have reached \$25 million in sales several quarters back and was only at \$2.5 million to date. Try giving away more T-shirts and coffee mugs, boys.

Lt. Sullivan



One area that is beginning to turn around nicely for NeXT is the publishing market. With four announced page-layout products - FrameMaker, PasteUp, PageOne, and the Archetype system - NeXT finally has an answer for the publishing market. Sullivan's field analysis shows that buyers are listening.

For example, one of NeXT's VARs did a 100-unit deal to a newspaper in Mexico based on Archetype's engine. You wouldn't believe how many value-added resellers and systems integrators are interested in using the engine for their projects.

A piece of personal good news has come in. Rumor has it that NeXT has finally replaced Peter Karnig as publishing advocate, and the surprise is... she's Lt. Sullivan's cousin (or at least that's what he says). Julie Sullivan Acosta, recently of Sun Microsystems, will be filling Karnig's old position. She was last a senior product manager in SunPics (the printing and imaging business unit that was formed last year in Sun's planetary realignment) focusing on font technology and printing software.

In the meantime, Color Tomorrow's contract has been extended to follow up the more than 500 leads from the NeXT Publishers Alliance conferences at Seybold and Imprinta.

Lt. Sullivan met with literary lion Norman Mailer during his recent Agency visit. Norm's got some very romantic notions about how intelligence is gathered. In the NeXT world, a T-shirt signed by Steve Jobs brings in the data. Get yours in exchange for an insider tip sent to Sullivan at sullivan@nextworld.com or his voice mail at 415/978-3374.

NeXT

As NeXTWORLD took to the streets, 25,000 systems had been sold.

Still, as of January, the market. NeXT itself had only one first look at the state of the market.

Because there was so much Expo. The study was designed to be completed from among the 52 position, the sample included surprisingly aggressive systems.

Our other original research North American sites and commercial, education, and government. The data is supported by research analysis, but comes from the marketplace.

Consider this report slightly blurred in some spots. NeXTWORLD will undergo sophisticated research and analysis devoted to the NeXT market.

By then, the market patterns and will be the special report portrays a definition.

THREE-PIC



Pera

ILLUSTRATIONS BY J. OTTO SEIBOLD

or Laser Copier and the NeXT. product supports the non-script IPU-10 RIP, allowing SCSI connection to the copier.

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will mean additional costs for your house, you don't want to

and as NeXT and Sun slug it out in installation in Alberta. At the moment, we know it had lost the sale, but, Sullivan's counterpart at Sun Canada was targeted to close sales several quarters back on date. Try giving away more

ing to turn around nicely for the market. With four announced FrameMaker, PasteUp, iSystem - NeXT finally has an outlet. Sullivan's field analysis

's VARs did a 100-unit deal to go on Archetype's engine. You've added resellers and systems in using the engine for their

news has come in. Rumor has it that Peter Karnig as publishing... she's Lt. Sullivan's cousin Costa, recently of Sun Microsystems was last a senior product business unit that was formed on font technology and

has been extended to follow up on Alliance conferences at Sey-

uler during his recent Agency about how intelligence is by Steve Jobs brings in the sent to Sullivan at sullivan-978-3374.



NeXT Market Mosaic

As *NeXTWORLD* took the measure of the NeXT market in the first quarter of 1992, we found it had finally developed a head of steam. Some 25,000 systems had been sold in 1991, and a vibrant community of users, developers, and resellers had grown up around the platform. New products announced in January held promise for mounting sales this year.

Still, as of January, the NeXT market had not yet settled into discernable patterns, and little research had been done about the youthful market. NeXT itself had only just settled on a coherent market strategy. To partially fill this void, *NeXTWORLD* has prepared this Special Report, our first look at the state of the NeXT market.

Because there was so little outside data to draw on, *NeXTWORLD* commissioned its own intercept study of attendees at *NeXTWORLD* Expo. The study was designed by the *NeXTWORLD* editorial staff and performed by Steven Fricke & Associates, a San Francisco research firm.

The survey results, presented here in the form of informational graphics, reflect our market sample: 229 10-minute spot interviews were completed from among the 5200 paid attendees of *NeXTWORLD* Expo. Because the Expo included a NeXT developer conference and product exposition, the sample included a large contingent - as much as 25 percent - of computer-industry respondents. This factor may account for the surprisingly aggressive system configurations, application usage, and purchase plans that figure in our results.

Our other original research is the Top 40 list of NeXT user sites compiled by *NeXTWORLD* staffer Eliot Bergson. The list includes only North American sites and omits some sensitive government customers, but we think it fairly represents the distribution of NeXT systems in the commercial, education, and government markets.

The data is supported by seven articles that focus on particular facets of the NeXT market. These are not intended to substitute for dry research analysis, but comprise a journalistic mosaic of trends in the marketplace.

Consider this report a snapshot of a market in formation - still slightly blurred in some spots, sharply focused in others. In the future, *NeXTWORLD* will undertake more-systematic research, drawing on sophisticated research samples and reflecting the full range of the NeXT market.

By then, the market will have matured into more-recognizable patterns and will be the subject of the same kind of data collection and analysis devoted to other computer platforms. Until then, this Special Report portrays a small but vigorous market in the process of definition.

Commercial workstations

NeXT Computer vaulted to nearly a fivefold increase in sales during 1991, a rate that secures the company a role as the fastest-growing vendor in the workstation industry, according to analysts. But, they add, whether the company can maintain this pace remains to be seen.

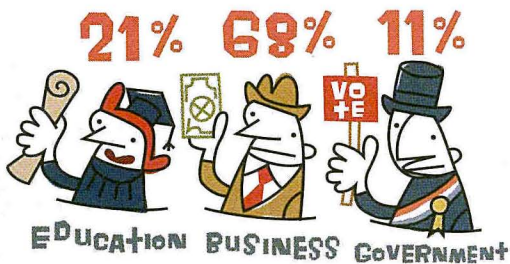
"NeXT is still a small vendor, but it is the fastest-growing workstation vendor in the marketplace," says Laura Segervall, senior analyst for workstations at Dataquest, a San Jose, California, market-research firm.

With approximately 15.5 percent of last year's 464,000-unit workstation market, NeXT is now ranked as the fifth-largest workstation vendor, according to International Data Corporation, another market-research firm, based in Framingham, Massachusetts.

NeXT's technology is best distinguished from other workstations by its NeXTstep operating system, user interface, and software development facilities, say analysts. But, they add, these very features have now been targeted by Sun Microsystems, Microsoft Corporation, and the IBM/Apple Taligent venture.

Leading workstation vendor Sun remains the chief competitor to beat. Its new operating system, Solaris 2.0, is due out this year and is said to offer its enormous installed base many NeXTstep-

THREE-PRONGED MARKET



Percentage by market segment

ILLUSTRATIONS BY J. OTTO SEIBOLD

like capabilities.

Microsoft's Windows NT isn't expected until late 1992 or early 1993, while the operating systems from Taligent won't be released until at least 1994 or 1995. Analysts say both will provide competition for NeXT.

"The bottom line is that [Jobs] has got great technology, but a more competitive market than he's ever been in before," says Tim Bjarin, president of Creative Strategies International, a Santa Clara, California, market-research firm. "Workstation vendors have been fairly complacent in their approach, but the fact is companies like Taligent and Microsoft are clearly going after that technology area," he says.

Bjarin applauds the announcement of NeXTstep's planned port to the Intel '486 platform as a strong strategic move to bring NeXTstep technology to a broader audience.

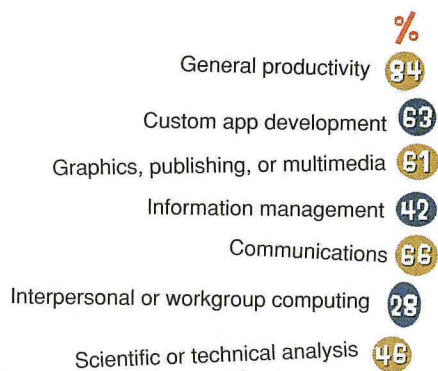
But other analysts say that NeXT doesn't necessarily have to compete as a standard workstation.

"I wouldn't characterize them as fitting into the traditional workstation market," says Bruce Lupatkin, managing director of technical research for Hambrecht & Quist, a San Francisco financial-investment firm. "They're going into what was supposed to be the domain of PCs but was never fulfilled," he says. This domain, he explains, is defined by the basic personal-productivity functions that PCs have provided, combined with NeXT's powerful and fast application-development capabilities. Described sometimes as the "commercial workstation" market, its advanced users aren't scientists or engineers but nevertheless require the processing and application-development power of workstations.

"NeXT made significant strides last year, but this will be a pivotal year for them," says Bjarin. ♦

by PAUL KARON

ACTIVE APPLICATION USAGE



Percentage using NeXT in application area

Healthy surprise

In a development that caught even Steve Jobs unaware, users have discovered that the NeXT's graphical capabilities and ease of use are making the computer an important tool for hospitals and the health-care industry as a whole.

"There's a definite trend every year toward fully electronic hospitals," says Peter Wasowski, president and CEO of Metecon, a Menlo Park, California, developer of NeXT-based medical-diagnostic imaging systems. "Hospitals are moving toward a point where all data of patient care and managing hospitals will be handled by computers, and NeXT is especially well-suited," he says.

Information systems managers at health-care institutions point to the NeXT's user-friendly interface and its high-resolution graphics imaging as its primary attractions.

"Doctors as a rule don't like to deal with computers," says Wasowski. "So our main task was to bring [into the market] a workstation that's very user friendly."

Another key advantage of the NeXT is its ability to easily combine high-definition images, text, and sound, according to Vimal Chowdhry, vice-president of finance at Mount Clemens General Hospital in Warren, Michigan.

"That makes it an ideal tool for communication of information throughout the hospital," says Chowdhry. The 282-bed osteopathic hospital already has 30 NeXTstations installed and plans to order up to 100 more, says Chowdhry.

Under the Mount Clemens plan, everything about the patient—lab tests, medical history, prescription information, billing, insurance, and so on—will be maintained in a NeXT system. For information at the hospital to move efficiently, Chowdhry explains, this data must be coordinated and delivered easily to those who need it.

NeXTs are being installed at sites around the hospital, including operating rooms, so that surgeons will be able to consult X-rays and other information during operations without leaving the sterile scrub area. The hospital is also planning to run a pilot program with NeXT machines installed in the offices of admitting physicians, so they can have the same quick access to patient information.

Routing information was also a major consideration for the San Diego Hospice, which provides medical services and visiting nurses for 24 terminally ill inpatients and home care for 275 outpatients. Sixty NeXTstations are part of a fully electronic medical-records system.

Systems like the hospice's have convinced NeXT's marketing staff that their product is a natural for this area.

"Health care is going to be one of our most important markets," says Ken Rosen, emerging markets manager for NeXT. More than 40 developers attended a by-invitation-only medical-developers symposium at NeXTWORLD Expo, and NeXT is in the process of cementing several deals for more than 1000 units with health-care providers, according to Rosen. ♦

by PAUL KARON

MULTI



Median

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Like shadows behind this government agencies have installations, with up to 30 they hesitate to publicize th

Nevertheless, it is known in the Department of. A thriving industry of consultants has sprung up to support this growth mar

NeXT third parties are market. For example, Hetr Tempest version of the NeXT. To prevent eavesdropping won a contract to supply a removable mechanisms so and key. And several NeXT sales to "secret" customers

NeXT is also enjoying sites and law-enforcement. as a whole—including local for about 12 percent of Ne

In some cases, intelligence be simple office automation highly specialized trade. Initially advanced platform the sified projects, and they do government agencies.

"Intelligence and defense software solutions that they Fuller, president of GWF Si consulting firm working with "The NeXT facilitates the quicker turnaround, resulti

There are few customer community that NeXT is a Advanced Research Project Arlington, Virginia, which create a fully paperless office by the Information Sciences

MULTIUNIT SITES



Median site has three NeXTs in use

Black market

Like shadows behind this Special Report's list of Top 40 user sites, government agencies have quietly become some of the largest NeXT installations, with up to 300 workstations. But for security reasons they hesitate to publicize their use of the platform.

Nevertheless, it is known that NeXT has found a ready customer in the Department of Defense and its related intelligence agencies. A thriving industry of NeXT systems integrators and consultants has sprung up in the suburbs around Washington, D.C., to support this growth market.

NeXT third parties are also benefitting from the government market. For example, Hetra Computer of Vienna, Virginia, sells a Tempest version of the NeXT computer that is electronically fortified to prevent eavesdropping. Last year, Microtech International won a contract to supply a large number of disk drives with fully removable mechanisms so that users can keep their data under lock and key. And several NeXT software suppliers have reported large sales to "secret" customers.

NeXT is also enjoying notable success at government research sites and law-enforcement agencies. In fact, the government market as a whole – including local, state, and federal agencies – accounted for about 12 percent of NeXT's 1991 sales, according to NeXT.

In some cases, intelligence-agency applications are reported to be simple office automation projects, but others focus on their highly specialized trade. Intelligence customers need a technologically advanced platform that allows them to develop their own, classified projects, and they don't have to scrimp like some other government agencies.

"Intelligence and defense have a strong need for sophisticated software solutions that they cannot buy off the shelf," says Gary Fuller, president of GWF Sierra Concepts, a Sonoma, California, consulting firm working with NeXT in the intelligence community. "The NeXT facilitates the development of custom software on a quicker turnaround, resulting in higher productivity."

There are few customers with ties to the defense-intelligence community that NeXT is allowed to talk about. One is the Defense Advanced Research Projects Administration (DARPA), based in Arlington, Virginia, which is using about 200 NeXTs in a project to create a fully paperless office. The two-year project, being developed by the Information Sciences Institute (ISI) at the University of South-

ern California School of Engineering, involves managing all of DARPA's documents electronically.

The system will use off-the-shelf hardware and software along with ISI's custom software to scan, index, manipulate, and transmit all incoming documents, including those with sound and video attachments. "We don't know of anyone who is performing document management the way we plan to with the NeXT," says Dan Pederson, director of ISI's Information Processing Center.

The 100 NeXT systems at Argonne National Laboratories, a multipurpose Department of Energy facility operated by the University of Chicago, are used primarily for basic and applied research in nuclear reactors. But in one application that could serve the Pentagon's Joint Chiefs of Staff, Argonne researchers are using the NeXT to prototype battle-simulation scenarios residing on various computing platforms into one model.

The Joint Space Intelligence Center, in Colorado Springs, Colorado, uses NeXTs to try to ascertain the mission of foreign satellites. The system uses software from Analytical Graphics, of King of Prussia, Pennsylvania, which develops software for the design, launch, and operation of satellite systems.

NeXT's early success in this arena stemmed from its connections to integration partners that directed the company to potential customers. But NeXT employees say that their continued success is due to the customers' recognition of a better mousetrap.

"We're focusing primarily on the more advanced computer-using segments of the federal marketplace – military, intelligence, R&D labs, energy – for whom UNIX workstations are familiar tools and custom applications are absolutely critical," explains Ron Weissman, NeXT's director of strategic marketing.

NeXT targets sales to the defense and intelligence market through its own direct sales force, leveraged by systems integrators and strategic resellers familiar with the intricacies of selling computers to the government.

NeXT's top salesman, CEO Steve Jobs, has also been active in selling to government agencies, making presentations to both large and small audiences and even offering suggestions for specific applications. "Steve is one of the few people who know the specifics about our involvement at some agencies," says one NeXT district sales manager.

by STUART SILVERSTONE

# of NeXTs	% of Sites
1	26
2 - 5	38
6 - 10	11
11 - 25	13
26 - 75	7
76 - 600	5

Percentage breakdown by size of site

Local customs

NeXT calls them "mission-critical custom apps." Not every user is familiar with the buzzword yet, but many have discovered that custom applications developed on the NeXT are the surest route to software that works for them. They tout the ease of prototyping and modification of existing code, as well as the cost savings that come from the do-it-yourself approach made possible by NeXTstep.

"We have discovered that the cost of developing our own apps on the NeXT costs the same as or less than buying an 80 percent solution off the shelf and then spending money to achieve the final 20 percent fit," says Gregory Miller, information systems director at the Portland, Oregon, law firm of Marger Johnson McCollom & Stolowitz. "This way we get exactly what we want, precisely tailored to our requirements."

Among NeXT users surveyed by *NeXTWORLD*, custom-application development is an even more common use of the NeXT than database management, with 63 percent of users reporting that they use their machines for this purpose.

Marger Johnson, for example, was so excited about custom development that it helped launch a systems-consulting company, Inherent Technologies. It is developing a customized legal-information database that serves as a work-flow management tool to track every task for every project for every lawyer in the firm.

"Missed deadlines result in malpractice [accusations]," explains Miller, adding that a computerized docketing manager also helps to decrease malpractice insurance premiums.

His firm uses the NeXTstep Interface Builder to create application prototypes. These are then tested by secretaries and other support staff who suggest additional features that would make the actual application easier to use. "The net result is that we can more rapidly prototype exacting apps in just a fraction of the time it would have taken on another platform," Miller says.

Speed of development is also cited by many other users as the chief benefit of the NeXT.

"It took three months to develop a program that we think would have taken a year and a half on a Sun," says Robert M. Wilen, vice-president of the office-automation group at SBC/OC Services in Chicago, which has developed a NeXT-based trading system.

For Rick Peters, president of Oceania Health Care Systems, in Palo

Alto, California, the NeXT offers the ability to satisfy users and MIS managers at the same time. As a NeXT value-added reseller, Oceania is developing an automated medical-record system for the 60 NeXT stations installed at the San Diego Hospice.

"This way users get what they want, which is customization, and their MIS group gets what they want, which is rock-solid tools that they don't have to worry about or modify," says Peters.

Other users simply feel that that NeXT's system features allow the development of the best application possible. "[The NeXT] is the best machine for being able to do what you want to do," says Eric Spahr of Lehman Bros. in New York. His company is using the NeXT to create specialized financial-analysis programs.

Many users also turn to the NeXT as the most cost-efficient development platform.

The Association of Racing Commissioners International (ARCI), a service organization for the horse- and dog-racing industry, has designed and is now testing an Oracle database front end running off a NeXTcube server. The system allows users to view licensing records for jockeys, stewards, owners, and trainers via remote telecommunications.

"NeXT offered a cost-effective solution, while providing the best system opportunities in terms of development and ease of use," says Neil Greene, ARCI's director of computer-information services.

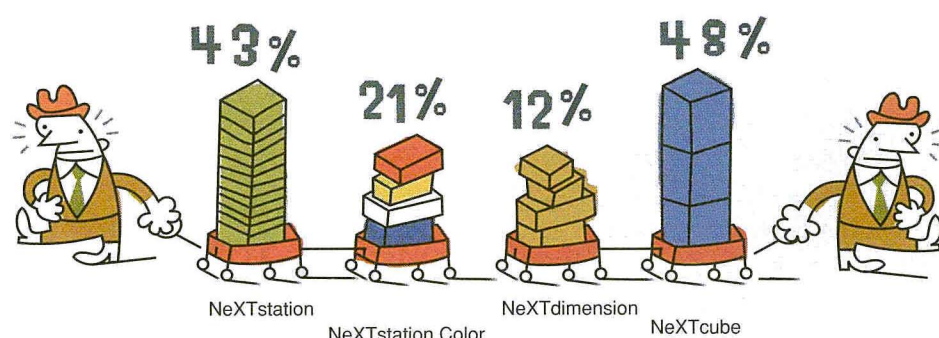
Morrison Knudsen Corporation, a mining company based in Boise, Idaho, turned to custom development to make up for the limited number of software packages available for the NeXT, according to Jim House, senior information services manager. The company also wanted to use the NeXT to set a high standard for all in-house applications to be developed in the future.

Users such as House realized the NeXT advantage for custom development even before NeXT did.

"It took our customers to help us figure out that custom applications would be popular with corporate developers," says Mike Slade, NeXT's director of marketing. "We were trying to sell Improv and WordPerfect. [Our approach was,] 'Our mail is better than your mail.' But customers don't think those things are broken. Custom apps are the thing that convinces them. It's the hook." ♦

by STUART SILVERSTONE

STATIONS SURPASS CUBES



Percentage by model type owned or used

Once more

When the original Cube was introduced by its company as the best of its kind, years and significant system development have materialized. Now, the NeXT for publishing applications, despite the relative

The large percentage of users surveyed who are using the NeXT for publishing applications reflects the importance of multimedia in the publishing industry. 61 percent of respondents

The NeXT system is well-suited for publishing applications: true on-screen representation of text and graphics. The system's architecture includes system-level features that enable software to specify the layout and NeXTstep's development environment integrates graphics into most applications.

Adobe Systems uses the NeXT for publishing applications, and generates a variety of platforms – such as the integrated system, says Adobe. "The NeXT has a lot of people. . . . People use it for office tasks as well as for publishing."

For now, FrameMaker is the primary application for the NeXT. Other publishing applications, such as Pages Corporation and Aldus, have been announced but not yet released.

The graphics-application selection of products. Such as the Design's Diagram as the primary product, followed by Adobe's Illustrator, Design's Create. This specialization package, and Apple's further sweeten the graphics market represented by just one product, MediaStation.

At the Seybold conference, Apple demonstrated a document-based application designed for the NeXT.

Archetype indicated that the NeXT product based on the object-oriented, fully formatted text on the object.

Archetype's document-based strategy, which encourages the use of modular software modules.

At press time, NeXT was developing the NeXT Publishing Environment, a standard set of protocols for publishing applications. The specification, which

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Once more, with feeling

When the original Cube was introduced, the NeXT was ballyhooed by its company as the best publishing machine available. Yet three years and significant system improvements later, very little key software has materialized. Nevertheless, many users recognize the value of the NeXT for publishing applications and are using it for that task, despite the relative dearth of software.

The large percentage of respondents to the NeXTWORLD survey who are using their NeXTs for graphics, publishing, and multimedia reflects the importance of this application area – a full 61 percent of respondents say they’re using NeXTs for these functions.

The NeXT system was designed to be a strong platform for publishing applications: The NeXT’s Display PostScript provides true on-screen representation of fonts and graphics; its color architecture includes system-level support for an 8-bit alpha channel that enables software to specify a degree of transparency for each pixel; and NeXTstep’s developer toolkits make integrating TIFF and EPS graphics into most applications easy.

Adobe Systems uses over 100 NeXTstations for development, publications, and general office work. “We use FrameMaker on a variety of platforms – Sun, NeXT, Macintosh, PCs – as part of our integrated system,” says Chris Hunt, head of UNIX systems at Adobe. “The NeXT has become the primary machine of choice for a lot of people. . . . People use it to receive mail and other general office tasks as well as for publishing.”

For now, FrameMaker remains the only page-layout offering for the NeXT. Other publishing applications, including Pages from Pages Corporation and PasteUp from RightBrain Software, have been announced but not yet shipped.

The graphics-application category can boast a more robust selection of products. Survey respondents named Lighthouse Design’s Diagram as the most commonly used graphics application, followed by Adobe’s Illustrator, Appsoft’s TopDraw, and Stone Design’s Create. This spring, Altsys Virtuoso, a FreeHand-like illustration package, and Appsoft Image, a photo-retouching tool, will further sweeten the graphics pot. The multimedia category is still represented by just one product, Imagine’s media database, MediaStation.

At the Seybold conference in February, Archetype Corporation demonstrated a document object that will serve as a foundation for text-based application development.

Archetype indicated that it will also ship a shrink wrapped product based on the object, which will support the exchange of editable, fully formatted documents with other applications based on the object.

Archetype’s document engine fits neatly into NeXT’s software strategy, which encourages the development of interoperating software modules.

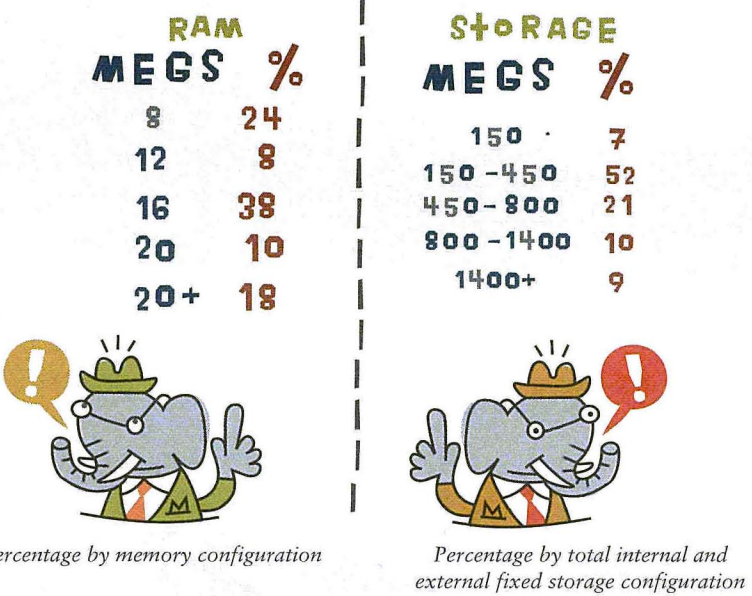
At press time, NeXT was working on a document called The NeXT Publishing Environment (NPE), which will outline a standard set of protocols for the development of interoperable software. The specification, which includes the Archetype object, would also

suggest standards for user interface, color separation, and other key aspects of publishing software.

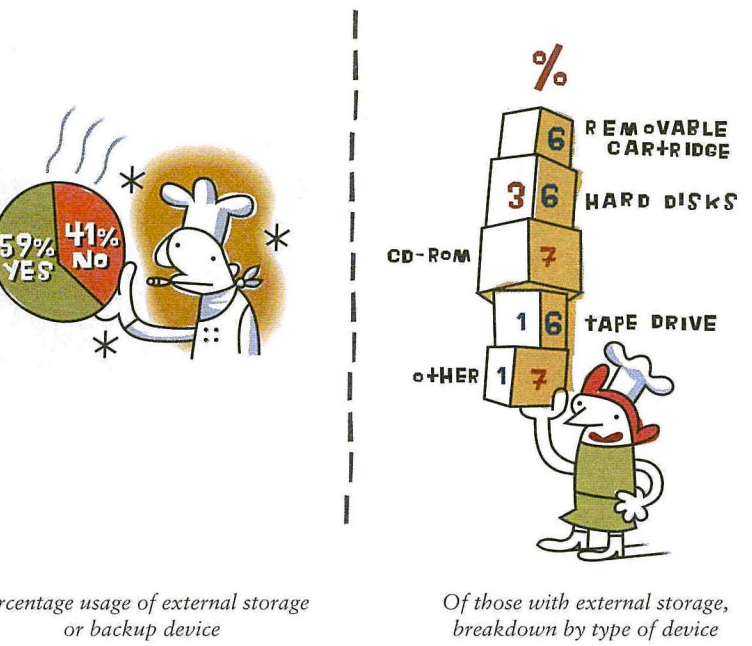
The NPE is seen by many vendors as proof that NeXT hasn’t forgotten publishing. When it appears, publishing will be the first application area to receive the benefit of such a development environment. And this means that users may soon be able to choose the NeXT as a publishing vehicle because of – not despite – the publishing software that runs on it. ♦

by DARCY DiNUCCI

MOST SYSTEMS ARE LOADED



STORAGE OPTIONS PROLIFERATE



Big base, big plans

Survey data and interviews about NeXT memory and storage configurations suggest that most users are opting for the performance that comes from a well-configured machine.

In the NeXTWORLD Expo intercept study, only 24 percent of those responding used NeXTstep computers with 8MB of RAM, the minimal configuration for a monochrome system. Another 8 percent had 12MB of RAM, the minimal configuration for a NeXTstation Color. The rest – two-thirds of those responding – had 16MB of RAM or more.

"As the base configuration, most everyone is using at least 16MB of RAM," says Alex Cohn, president of Objective Technologies (OTI) in New York, a NeXT consulting firm that caters to the financial community.

Indeed, it seems that after delivering a 25-MIPS workstation for under \$5000, NeXT has discovered that most of its customers want desktop Ferraris, not Volkswagens – and the customers are willing to spend the extra money to get faster, more powerful machines.

Although customers want more RAM and mass storage, they're not buying them from NeXT. "We've tended to buy just 8MB machines from NeXT," says Alex Henry, director of MIS at the William Morris Agency in Beverly Hills, California. "Where we need better performance, we upgrade them with third-party memory."

"Everyone tries to ramp up on memory, which means buying as lit-

tle as you can get away with from NeXT and buying more from third parties," says Cohn. "Everyone I know, including us, has a bag of 1MB SIMMs."

Users are also ramping up on their disks. According to the study, 36 percent of respondents had external hard disks, and another 6 percent had removable-cartridge drives, such as a SyQuest or Bernoulli. Only 16 percent of users had access to a tape-drive system for performing backups.

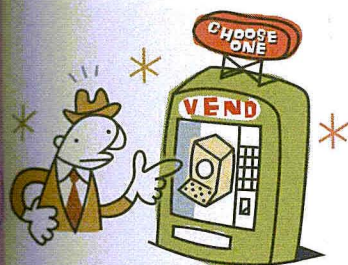
Customers thinking of upgrading NeXT computers in a networked environment should first think about upgrading their servers, says OTI's Cohn. The reason is simple: Anything that improves the performance of the server improves the performance of every other machine on the network that uses the server.

When configuring a server, OTI's Cohn tells his clients to "put in as much RAM as you can." Many of his clients have 64MB of RAM in their NeXTcube file servers. NeXT's Mach operating system uses extra memory in the server as a hard-disk cache.

Although the average number of NeXT workstations installed at any site was 17, 55 percent of the respondents reported working at sites with five or fewer NeXT computers.

More than half of the respondents also said that they intended to purchase additional memory, mass storage, or other peripherals within the next 12 months. That could mean big business for those companies providing third-party sales and support to the NeXT marketplace – and not just to the vendors offering the lowest prices. Many of NeXT's Wall

AMBITIOUS



Percentage planning 1

Mixed envi

Despite all the attention paid to heterogeneous computing workstations on networks with other research conducted by NeXT.

Among users surveyed, 54 percent of those planning their NeXT systems on networks with other workstations had an average of 24 NeXT workstations. Most of these NeXT clusters have at least one other workstation.

These NeXT clusters include 54 percent of Sun workstations; 52 percent of UNIX workstations. Most of these area networks, since only 2 percent and 22 percent to minicomputers.

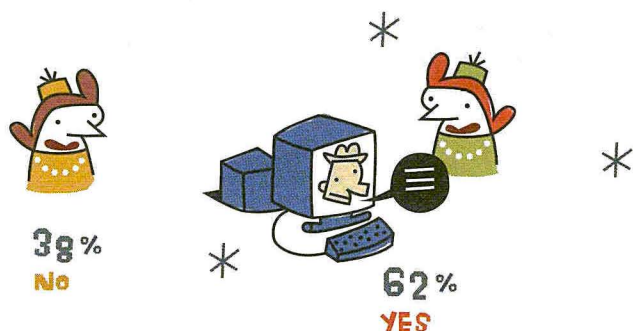
NeXT knows that connecting NeXTs along with all the other workstations is one of Most Congenial when it comes to that NeXT's effort has paid off.

"We found [installing NeXTs] pretty easy. We didn't realize how easy you talk to someone about it," says James House, senior manager of Morrison Knudsen's group of Morrison Knudsen NeXTs connected to roughly 15 Vines network, 15 Macs, 15 Suns, and an IBM R6000.

His company did encode documents through an SNM way to the Banyan Vines network, lay with the server not known to the receiving end.

Vince Jordan, director of Telecommunications, agrees that matches originate with other workstations most compliant," he says. "We have 60 NeXTs connected to SPARC-based file servers."

LARGE NeXT NETWORKS...



Percentage with NeXTs on networks

# OF NeXTs	% OF SITES
1	28
2-5	27
6-10	11
11-25	14
26-75	11
76-600	9

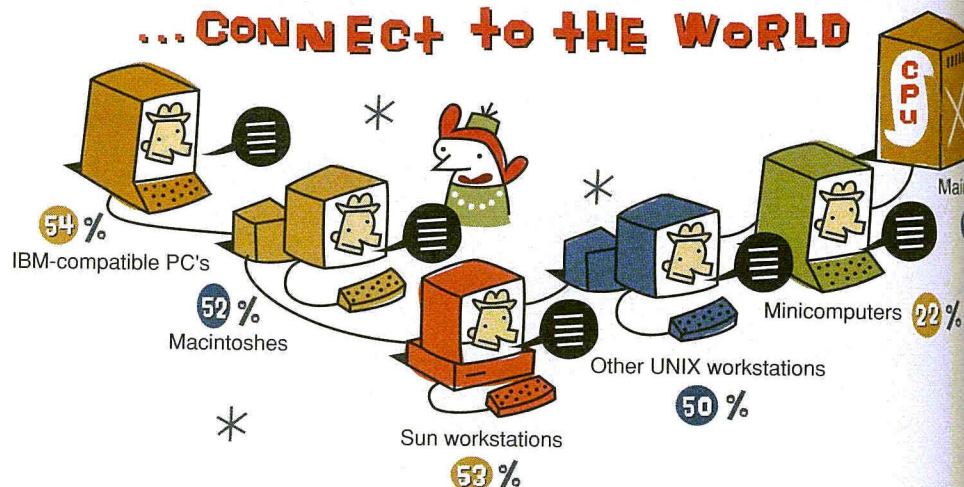
Of those with networked NeXTs, percentage breakdown by number of NeXTs on network

Street customers are willing to pay a premium price for top-flight service and same-day turnaround, Cohn says. That's a striking contrast to the cash-strapped university market that NeXT first staked out.

Three-quarters of the survey respondents said that they plan to purchase additional application programs within the next year, and more than half said that they plan to develop a custom application. More than 70 percent of respondents said that they expect to purchase more NeXT machines in the next year. ♦

by SIMSON L. GARFINKEL

...CONNECT TO THE WORLD



Percentage networked to other computers

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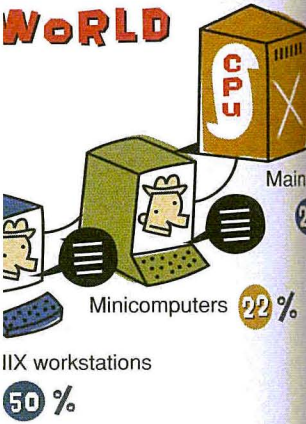
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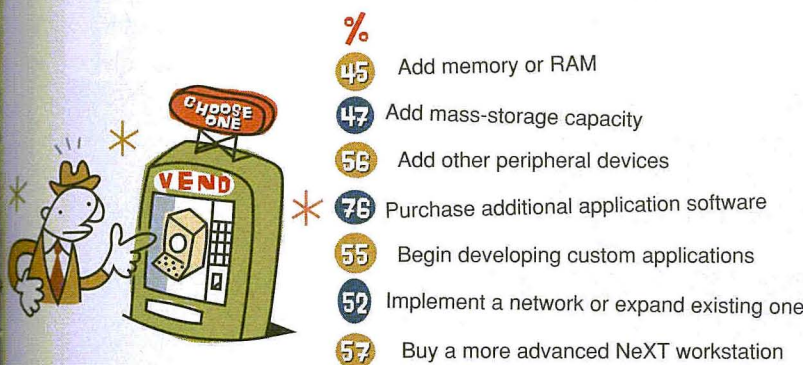
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AMBITIOUS PLANS



Percentage planning NeXT actions during next 12 months

Mixed environments

Despite all the attention paid to NeXT-only sites, the reality of a heterogeneous computing world means that most NeXT systems coexist on networks with other computers, according to users as well as research conducted by NeXTWORLD.

Among users surveyed by NeXTWORLD, 62 percent are running their NeXT systems on networks. These networks include an average of 24 NeXT workstations, but more than half of the networks have at least one other brand of machine in the mix.

These NeXT clusters are primarily connected to PCs and other workstations – 54 percent are connected to IBM PCs; 53 percent to Sun workstations; 52 percent to Macs; and 50 percent to other UNIX workstations. Most of the NeXTs seem to reside on local-area networks, since only 24 percent are networked to mainframes and 22 percent to minicomputers.

NeXT knows that connectivity is crucial to its success and, along with all the other workstation vendors, it competes for the title of Most Congenial when it comes to networking. Customers report that NeXT's effort has paid off in terms of ease of installation.

"We found [installing NeXTs on a Banyan Vines network] to be pretty easy. We didn't really have any complaints, and usually when you talk to someone about setting up a network, they have a lot," says James House, senior information services manager for the mining group of Morrison Knudsen Corporation. His group has 21 NeXTs connected to roughly 2000 DOS machines via a Banyan Vines network, 15 Macs, a couple of Wang VS machines, some Suns, and an IBM R6000 connected on a TCP/IP network.

His company did encounter some difficulty with passing e-mail documents through an SMTP (Simple Mail Transfer Protocol) gateway to the Banyan Vines server, but House says that the problems lay with the server not knowing what to do with attached documents at the receiving end.

Vince Jordan, director of software development at Williams Telecommunications, agrees that many of the networking mismatches originate with other systems. "The NeXT machines are the most compliant," he says. His research-and-development division has 60 NeXTs connected to two SPARCstations, and two Auspex SPARC-based file servers over a twisted-pair Ethernet network. The

NeXTs also have a T-1 link to another facility a mile away.

But not all connectivity problems have been solved. Connecting NeXTs to wide-area networks cause the most inconvenience, though most problems can be fixed with some jimmying, according to users. The most common difficulty is with e-mail, since most other systems can handle NeXTmail text but lose many of the attachments.

"We are increasingly moving away from [heterogeneous environments]," says Gregory Miller, information systems director at the law firm Marger Johnson McCollom & Stolowitz in Portland, Oregon. His company has 20 NeXTs connected to DOS workstations and a Novell server via PC-NFS, and will be using a SLIP (Serial Line Internet Protocol) connection and Marble Associates' Teleconnect to connect to a wide-area network.

The firm plans to phase out the remainder of its DOS machines this year, but Miller says NeXT still has some issues to face in terms of wide-area networks, particularly in complete support of UUCP (UNIX to UNIX Copy Protocol) and the provision of better system-administration tools.

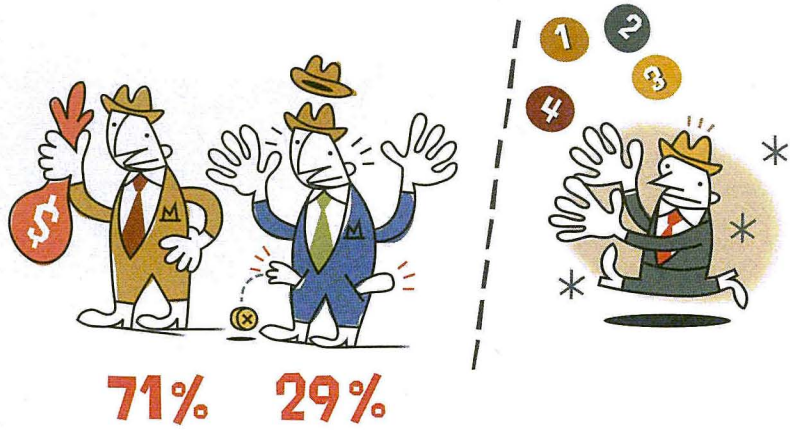
For example, he explains, NeXT needs to account for other forms of UUCP addressing, namely bang addressing. "[NeXT has] a refusal to recognize that they must play in a generic UNIX world. . . . They shouldn't forget their UNIX roots," says Miller.

Phibro Energy, in Greenwich, Connecticut, is also standardizing on NeXT, with 75 percent or more of the company's users switching to the platform, according to Network Manager Jonathan Fields. But for network file servers, the company will continue using Suns. "The NeXT just isn't ready," says Fields. He also recommends that Ethernet segment sizes be reduced with NeXT networks, since the NeXT has a low tolerance for high traffic volume.

Though most users say that NeXT connectivity is relatively headache-free, NeXT still has work to do, particularly integrating into other UNIX environments and providing better system-administration tools. ♦

by CLAIR WHITMER

INSTALLATIONS TO GROW



Percentage planning to buy additional NeXT systems during next 12 months

Of those new purchases, median site will buy four additional NeXTs

Top 40 North American NeXT Sites

To get a better idea of what the NeXT market really looks like, NeXT-WORLD surveyed the largest installed sites in North America. Candidates for the Top 40 came from NeXTWORLD's own database and NeXT's customer lists, but the installed base figures and other site information were provided in telephone interviews by NeXT managers at each site. The installed base includes computers in use as of April 1,

1992. Contracted purchases for later delivery are noted separately.

The list covers North American customers only. It specifically excludes sites involved in sensitive military or intelligence work. The installed base for universities on the list includes only computers owned by the institution, although separate figures are provided, when available, for machines sold through university stores to students for personal use.

	Company/Location	Installed base	Key applications	Software in use
1	SBC/OC SERVICES Chicago	320	Office automation, stock and bond trading	WordPerfect, Concurrency, Diagram, Improv, Wingz, SpeedDeX, Pencil-Me-In
2	WILLIAM MORRIS AGENCY Beverly Hills, CA	310	Office automation, word processing, e-mail	Custom apps, Who's Calling, bundled apps, Improv
3	LOS ANGELES COUNTY SHERIFF'S DEPARTMENT Los Angeles	295 (250 more in 1992-1993)	Executive support system for fiscals, office automation	Oracle, Wingz, Boss Logic, FrameMaker
4	INDIANA UNIVERSITY Bloomington, IN	250	Journalism, physics, math, computer science, speech and hearing, psychology departments	FrameMaker, WordPerfect, Illustrator, Mathematica DataFile
5	UNIVERSITY OF BRITISH COLUMBIA Vancouver, BC	230	Computer science lab, poison-control research center, math, commerce, speech, botany departments	Improv, Mathematica, TeX, Illustrator, Diagram, WordPerfect
6	ERGO Newport, RI	200	Automation of health-care services	Custom apps by Crystal Computer Systems, WordPerfect, Improv
7	DARPA/ISI Marina del Rey, CA	200	Office productivity and on-line document management	Custom apps, Boss Logic Document Manager, FrameMaker, Improv
8	ITESM Monterrey, Mexico	190	Advanced computer lab, satellite delivery of educational programs to 26 campuses	FrameMaker, MediaStation, custom communication apps for PC networking, WordPerfect
9	ROSE-HULMAN INSTITUTE OF TECHNOLOGY Terre Haute, IN	185	Open labs and classrooms, math instruction, computer science, electrical engineering departments	Custom apps, Mathematica, FrameMaker, Wingz
10	CARNEGIE MELLON UNIVERSITY Pittsburgh	175	Computer science and robotics, speech, math, graphic design, architecture departments	Custom apps, Mathematica, Illustrator, Diagram, WordPerfect, Improv
11	SIMON FRASER UNIVERSITY Burnaby, BC	170	Community lab, computer science lab, engineering, English, economics departments	FrameMaker, Allegro CL Common Lisp, Improv, Mathematica, SAS
12	ALLEGHENY COLLEGE Meadville, PA	165	Math, biology, chemistry, writing program, philosophy, physics, modern-languages departments	Custom apps, Mathematica, Improv, Diagram, WordPerfect
13	FIRST NATIONAL BANK OF CHICAGO Chicago	150-175	Capital markets sales, trading, and research	Custom apps, Wingz, WordPerfect, Improv, Diagram
14	WILLIAMS TELECOMMUNICATIONS The Woodlands, TX	150 (100 more by year-end)	Custom software development and office automation	Improv, Diagram, Illustrator, Who's Calling, FrameMaker, DataFile, Concurrency
15	UNIVERSITY OF TEXAS AUSTIN Austin, TX	150	Campus computing center, office of telecommunications, math department	Mathematica, TopDraw, WriteNow, Wingz, WordPerfect
16	OHIO STATE UNIVERSITY Columbus, OH	140	Inventory control throughout university, office productivity, calculus lab	Custom apps, Mathematica, Diagram
17	ALAIN PINEL REALTORS Los Gatos and Saratoga, CA	132	Reporting, interaction with real-estate boards, databases, accounting	Custom apps by Adamation, Improv, Who's Calling
18	UNIVERSITY OF CHICAGO Chicago	130 (220 more in 1992-1993)	Business school, biosciences division, Enrico Fermi Institute (physics department)	Mathematica, Improv, Sybase
19	UNIVERSITY OF MARYLAND College Park, MD	125 (125 more to students)	Math department, computer science center, open labs	Custom apps, Mathematica, TeX, Improv, WordPerfect
20	COLORADO SCHOOL OF MINES Golden, CO	125	Math, physics, engineering, geophysics departments	Custom apps, Mathematica, WriteNow, TeX, WordPerfect
21	PHIBRO ENERGY Greenwich, CT	120 (290 more in 1992)	Trading and risk management, credit and treasury, scheduling	Custom apps, WordPerfect, Improv
22	ADOBE SYSTEMS Mountain View, CA	115	Software development, technical publications, office automation	FrameMaker, developer tools, Illustrator, Mail, WriteNow, DisplayTalk, Improv
23	PREFERRED HEALTH CARE Wilton, CT	106 (940 more in 1992-1993)	Front end to Sybase, managed health care	Custom apps, Sybase, Improv, Wingz
24	UNIVERSITY OF ALBERTA Edmonton, Alberta	100 (100 more to staff and students)	Chemistry, physics, space physics departments	Mathematica, FrameMaker
25	PRINCETON UNIVERSITY Princeton, NJ	100	Library, computer science, music, math departments	Mathematica, WordPerfect, Diagram, bundled apps
26	ARGONNE NATIONAL LABORATORY Argonne, IL	100	Office automation, cooperative education with Chicago State University	Custom apps, Diagram, Mathematica, WordPerfect
27	TRIMARK FINANCIAL CORPORATION Toronto	100	Accounting, office support, mutual-fund client services	Custom Oracle tools package, Diagram, WriteNow, Improv
28	BOZELL Irving, TX	90	Office automation	Custom apps, WordPerfect, Improv, bundled apps
29	UNIVERSITY OF NEW ORLEANS New Orleans, LA	90	Computer science, math department, office of research, grants management, correspondence and newsletters	FrameMaker, Mathematica, Improv, WordPerfect
30	GEORGIA TECH Atlanta	90	Computing center, math, computer science, physics departments	Mathematica, Improv, WordPerfect
31	UNIVERSITY OF CALIFORNIA RIVERSIDE Riverside, CA	80	Psychology lab, open campus labs, chemistry, math, geology	Custom apps, SAS, SoftPC, Diagram, Mathematica, WordPerfect
32	MRJ Oakton, VA	80	Application evaluation and development	Improv, WordPerfect, Diagram
33	UNIVERSITY OF MICHIGAN Ann Arbor, MI	70 (50 more to students)	Public Access Lab, electrical engineering, physics, economics departments	Mathematica, Improv, SoftPC, Diagram
34	SAN DIEGO HOSPICE San Diego	60	Medical records, corporate administration, link to notepad computers used on house calls	Custom apps from Oceania Health Care Systems, Sybase, Improv
35	GETTYSBURG COLLEGE Gettysburg, PA	55	Administration, physics, computer science, math departments, honor students	Improv, HSD Scan-X Color, FloppyWorks, Mathematica, WordPerfect
36	PINOLE POINT STEEL Richmond, CA	55	Financial analysis, inventory tracking, office automation, materials requirement planning	Oracle Financials, Improv, Pittsburgh Project Manager, WordPerfect
37	GUSTAVUS ADOLPHUS COLLEGE St. Peter, MN	53	Library, math, computer science, music, art, economics, psychology, philosophy departments	Mathematica, Improv, Wingz, SAS, WordPerfect
38	UBS SECURITIES New York	50 (more in 1992)	Trading of stocks, options, and futures; bonds and treasury to come	Custom apps, Mathematica, Improv, FrameMaker, Diagram, Create, Wingz
39	UNIVERSITY OF KENTUCKY Lexington, KY	50	Open computing lab, telecommunications, math, computer science, English departments	Mathematica, Maple Symbolic Math, WriteNow
40	NORTHERN STATES POWER Minneapolis	40	Legal case management and document word processing	Custom apps by Boss Logic, 3270Connect, Diagram, Contact Manager, Document Manager, WordPerfect

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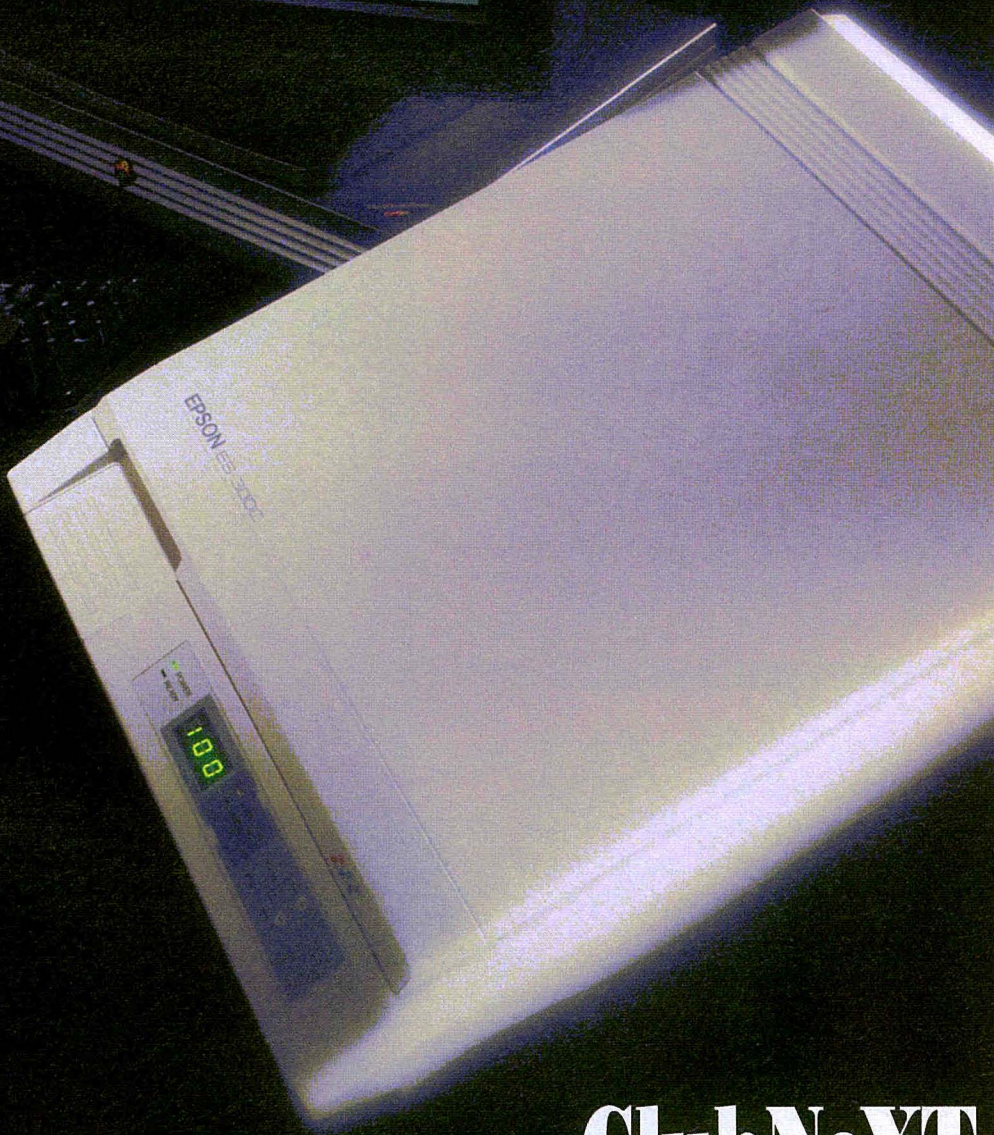
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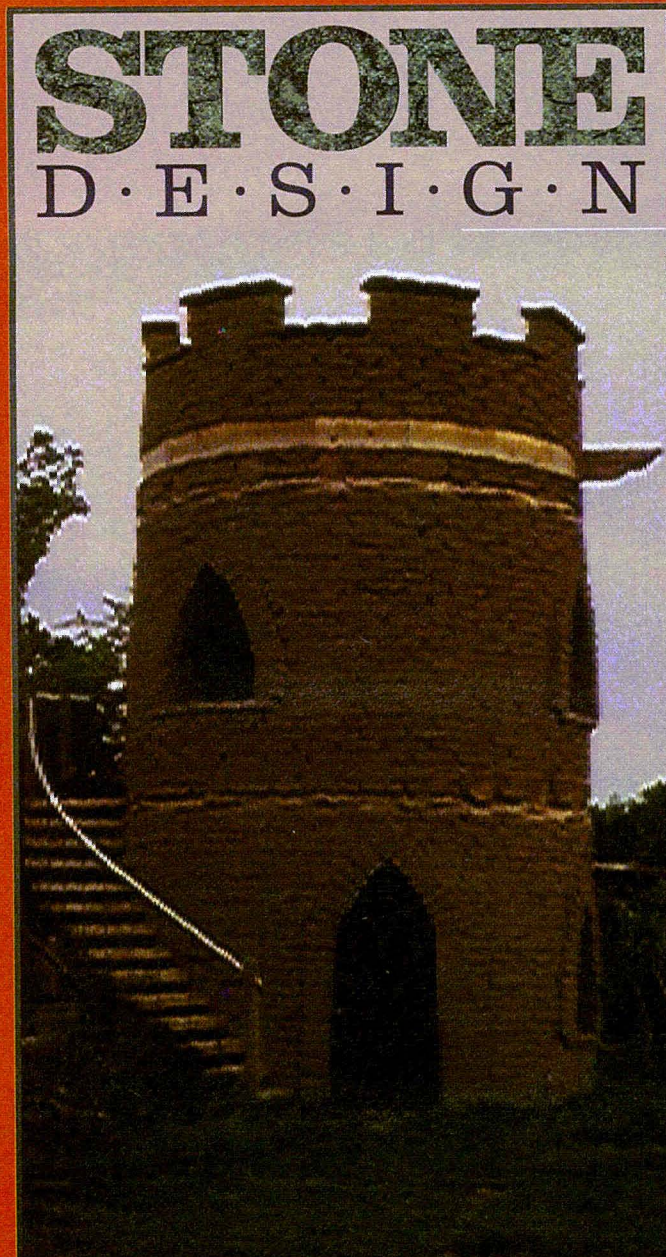
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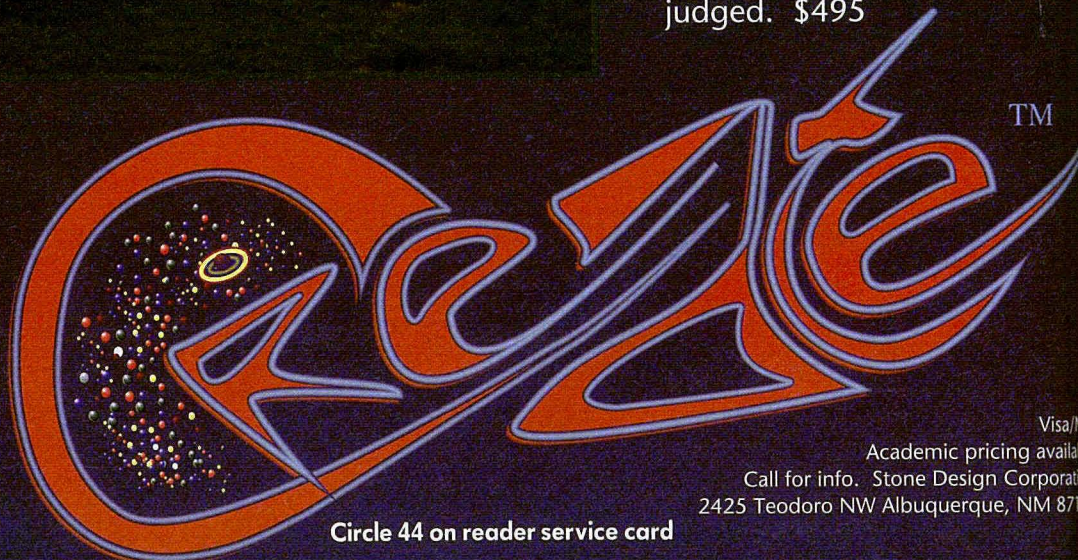
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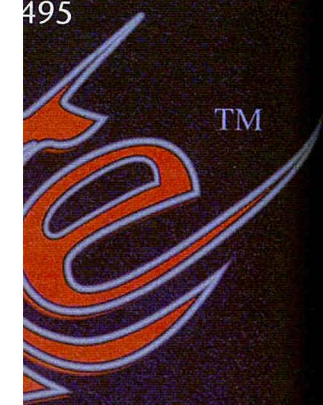
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Striking it Rich

Oil-trader leverages the future on NeXT

by Paulina Borsook

In the world of commodities trading, a few seconds can mean the difference between profitability and bankruptcy. For traders at Phibro Energy, the world's largest crude-oil trading company, combining that need for instantaneous decision making with running a huge shipping network and oil-refinement company makes their lives as slippery as the product they sell. And to better compete in the 24-hour-a-day commodities-trading arena of the 1990s, they've come up with a solution as black as the product they sell.

PHOTOGRAPHS BY RAYMOND MEEKS



According to its annual report, Greenwich, Connecticut-based Phibro, a subsidiary of Wall Street giant Salomon, is “a vertically integrated, full-service energy company.” But Phibro executives last year put rhetoric aside and launched a complete re-engineering of the 1600-employee company, which has agents spread across 24 countries. The solution they came up with – NeXTstations running custom in-house applications – has even allowed the energy giant to form a second company to resell the software to other players in the world of commodities trading.

Vision and engineering

Phibro executives had the vision that technology could be more than office automation. “In the ’80s, there was a computer on every desk, and people ran Lotus and had electronic mail. Computers weren’t really thought of as a tool. But we have to have a new approach in the ’90s, and use technology to give us a competitive advantage,” says Vinnie Annunziata, the Phibro trader in charge of the NeXT installation.

Computers will be absolutely critical to providing the support needed when the New York Mercantile Exchange (the “Merc”), hub of all oil and precious-metals trading in the United States, goes to 24-hour-a-day trading by the end of 1992. The volume of trades will increase significantly, so a company will have to cut its cost-per-transaction to maintain its competitive edge. Time-consuming trades that were once carried out over the phone are now handled instantly by computer because the Merc now processes eight times the volume of trades it did on opening in 1983. Phibro executives realized they needed a speedy and responsive computing infrastructure to compete.

Further, no commodities company can afford to keep adding back-office personnel indefinitely in the increasingly volatile and competitive global market. Even traditional Wall Street firms that have shunned commodities trading in the past are now getting into the business. Phibro needed the competitive advantage offered by an innovative use of leading-edge computing.

With these two needs in mind, Phibro President Andy Hall made the decision in December 1990 to re-engineer the entire work flow of the company, to rebuild the company from scratch. He charged the company experts in contracts, credit and treasury, trading, and risk management to put every aspect of Phibro’s mission under inspection and analyze both how work was being done and how it would be done in the perfect trading environment.

Such re-engineering would normally be considered a luxury, not a long-term corporate necessity. But Annunziata says that “in the oil industry, no producer would consider running a refinery at full or almost-full capacity for ten years without shutting down for a while to put in new, more cost-effective and efficient technologies.” Phibro determined that an equally ambitious and thoughtful investment in computing was just as critical to the long-term financial health of a trading company.

In pursuit of the re-engineering, top Phibro traders were partnered with outside systems analysts to create the computer environment that will carry Phibro through the ’90s. Hall had the foresight to ensure that, as Annunziata puts it, “the users were driving the MIS people. It’s often the case that the MIS people in a company drive the user.”

About 35 people worked on the project, taking ten months to design a seamless and highly efficient interconnection of trading and support functions. Their bold plan included a single flexible database that could integrate data from all areas of the company and replace several inefficient databases that had arisen in different departments. Positions, risk management, scheduling, automatic contract generation, as well as credit and treasury would be linked to each other and to an accounting package provided by Computron Technologies, a New Jersey-based software developer. The team also wanted to have just one computer on every desk and

have that computer do everything, including managing live feeds from Reuters and Telerate Systems news services. Traders wouldn’t be plagued by the excess of terminals (up to five or six in some cases) they previously needed to use in their work.

Making choices

By August 1991, Phibro was ready to decide which client stations should go with its new Sybase database running on a DEC VAX.

The chosen workstations would be replacing almost 900 Compaq personal computers. Annunziata says that the initial plan had been to use OS/2 running on Intel-based systems, but it soon became apparent that OS/2 simply did not have the seamless multitasking capabilities Phibro needed. The second option was UNIX, and the design team looked at workstations from IBM, Sun, and NeXT.

NeXT was in the running because several of the senior programmers were enthusiastic about NeXT’s technology and low price. Also, one of the consultants Phibro had hired to help supervise the re-engineering effort had close connections with a staff member of NeXT’s software development team. Nevertheless, Annunziata thought senior management would consider NeXT too risky a platform on which to bet the entire company.

Such concerns were soon erased after the evaluation units were installed and tested. Annunziata says that “the NeXT price/performance was so strong it won hands down. Within two weeks, everyone was hanging around the NeXTs, and the Suns were gathering dust. Besides, the Suns were too expensive.”

As a test of the decision to go with the NeXTs, programmers created four new applications for beta testing: A full-featured Rolodex application, a trade-capture system, an option-quoting application, and a graph generator were put together and installed within six weeks. “Both the users and the programmers loved the NeXTs. Programmers loved the ease of development offered by the object-oriented NeXTstep, and users loved the ease of use,” says Annunziata.

Initially, 90 NeXTs were installed. Some were for programmers and some for traders. The hands-on the machines rather than a reality.

How It Works

When the full system is in place, Phibro will have 100 Turbo Color machines with which will be equipped with black and white monitors.

Phibro’s London office will have 50 each will be installed in the satellite offices, a Sun SPARC 100 machines will be put in the New York office. That Phibro is constructing its new office from its Greenwich corporate headquarters.

The NeXTs enabled Phibro to create integrated multimedia applications that allow traders to put together contracts, letters, generate and integrate contracts, create contracts covering approval from the Phibro department, and fax the entire contract to the client – all without any reliance on support or reliance on support. It is ingenious enough that also be keyed to a trader’s voice, phone, or beeper. The NeXTs will be the le Phibro staffers to be the le producers they need to be.

Besides the custom application system is also running Informix Wingz spreadsheet, WordPerfect and other back-office support.

Annunziata says that the system has worked well enough to be used for the Phibro re-engineering half, from three years to on. Two people hired to run an because they weren’t needed. Nobody calls them,” Annunziata says. Phibro is so confident

NeXT User Profile

Organization: Phibro Energy

Business: Vertically integrated full-service energy company

Employees: 1600 worldwide

Hardware: 100 NeXT systems installed; 500 planned

Key software: Custom in-house programs supporting oil commodities trading, Informix Wingz and Lotus Development Improv spreadsheets, WordPerfect word processing software.

Purchase cycle: Two weeks after the request for proposals was issued, NeXT won hands down.

Costs: More than \$10 million, including re-engineering of the company’s work flow and work performed by contract programmers.

Immediate goal: Prepare the company for the globally competitive 24-hour-a-day trading environment of the ’90s.

Long-range goal: Create a separate subsidiary company that will act as a VAR selling the NeXT-based commodities-trading setup Phibro has developed.



William Morris

Although the
on the idea of
NeXTWORKS

310-machine installation
Hills, California, is currently
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“We can get a jump
deal,” Henry says. He has
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Initially, 90 NeXTs were installed at Phibro, some for the in-house
programmers and some for regular Phibro staff who wanted to get their
hands on the machines rather than wait for the full installation to become
a reality.

How It Works

When the full system is in place, Phibro traders will work on NeXTstation
Turbo Color machines with 21-inch displays, while back-office personnel
will be equipped with black-and-white NeXTstation Turbos.

Phibro's London office will get 100 NeXTstation Turbos, and about
50 each will be installed in satellite offices in Houston and Singapore. In
the satellite offices, a Sun SPARCstation II will act as the server. More than
100 machines will be put into place in a new, state-of-the-art trading floor
that Phibro is constructing in Westport, Connecticut, just down the road
from its Greenwich corporate headquarters.

The NeXTs enabled Phibro programmers
to create integrated multimedia programs that
allow traders to put together bids, create cover
letters, generate and integrate graphs into bids,
create contracts covering the bid, obtain
approval from the Phibro in-house credit
department, and fax the entire package to a
client - all without any rekeying of informa-
tion or reliance on support staff. The system
is ingenious enough that alarms and alerts can
be keyed to a trader's voice mail, e-mail, tele-
phone, or beeper. The NeXT solution will free
Phibro staffers to be the lean, self-sufficient
producers they need to be.

Besides the custom applications, the new
system is also running Informix Software's
Wingz spreadsheet, WordPerfect, Lotus Improv,
and other back-office support software.

Annunziata says that the NeXT solution
has worked well enough to cut the time allot-
ted for the Phibro re-engineering project in
half, from three years to only one and a half.
Two people hired to run an in-house help desk had to be given other jobs
because they weren't needed. "We call them the Maytag repairmen.
Nobody calls them," Annunziata says.

Phibro is so confident in the success of its NeXT-based system that it

has created an independent subsidiary, MC² Technologies, to market the
installation to other commodities traders. Annunziata was tagged as the
president of the start-up, which was launched in January.

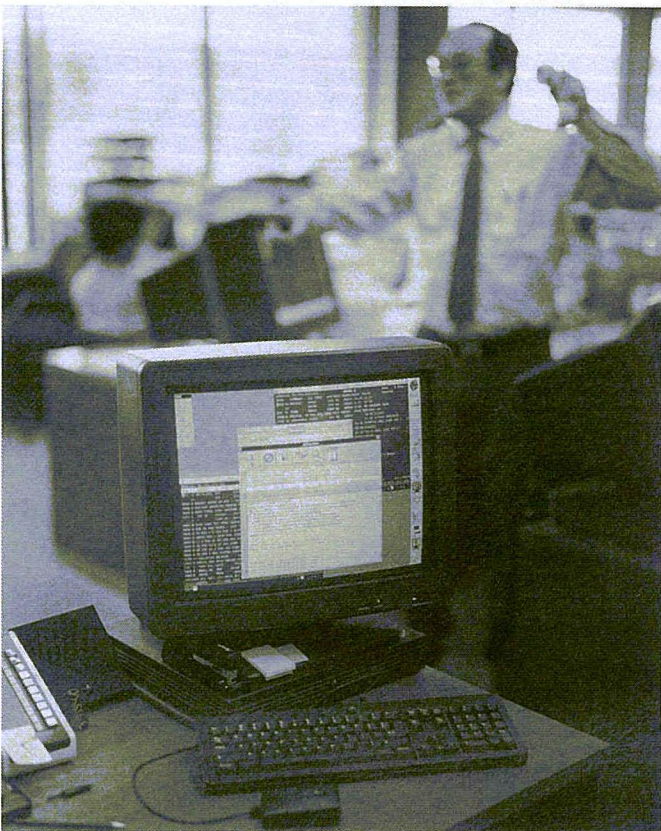
MC² (the name comes from Einstein's famous equation for energy)
will be housed separately from Phibro's new state-of-the-art trading floor
in Westport. By early 1992, other commodities companies were already
showing interest in what the new company was going to be selling, putting
MC² in the unique position of having to answer sales inquiries before its
initial offerings had even been announced - and before Phibro had even
completed the development and implementation of its own commodities-
trading system.

Catching Trends

Annunziata says that while bits and pieces of what MC² will have to offer
are available, "no single package exists"
that ties together all the different aspects of
commodities trading. While somewhat-
similar packages may exist for stocks and
bonds, "oil is a different animal." The fact
that oil is a product subject to the vagaries
of hard, real-world factors such as pipeline
breakdowns, shipping conditions, and
political developments "makes it a beast,"
he says. It's no wonder that newspaper
headlines are fed live into Phibro's system.

The MC² product will be firmly wed-
ded to NeXT hardware, with a '486
option available for those clients running
PC networks. Purchasers will be able to
create proprietary code around the base
MC² offering.

With all its custom NeXT work, Phi-
bro has come a long way since its original
PC-based plan. "Traders are good at
catching trends. At Phibro, we think we're
catching two trends at the same time: short
PC, long NeXT," says Annunziata. ▀



PAULINA BORSOOK is a New York based free-lance writer
specializing in computers and communications.



William Morris: Security, network issues being addressed

Although the openness of NeXTstep helped sell Alex Henry
on the idea of buying black boxes (see "The Star System,"
NeXTWORLD April 1991), the director of MIS for the
310-machine installation at the William Morris Agency in Beverly
Hills, California, is currently using his NeXTs to put a lid on informa-
tion leaks.

"We can get a jump on a job for a client and hold on to that
deal," Henry says. He has installed Cloak, an encryption program
developed by Objective Technologies of New York, that gives read-or
read-and-print access to files containing staff-meeting minutes. The

program prints a banner with the user's name on pages to dampen any
impulse to xerox and pass out the information. Cloak also denies all
cut-and-paste capabilities.

Henry is also working with Mike Clark, William Morris's net-
work administrator, to improve network response time, both in-house
and to their office in New York. "We're looking at routers, hubs,
clients, servers, and storage, but it's not the volume of what a company
has stored - it's how fast information gets from the server to the client
and back," he says.

by ELIOT BERGSON

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COMPOSITION

Getting With the Program

by Charles L. Perkins

Get started in NeXTstep programming
by building this easy game application

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Two common myths surround object-oriented programming: The first is that it takes years of training to do it properly, the second is that object-oriented programming is no more than traditional good programming practices dressed up. Both are wrong.

Object-orientation is a new way of looking at problems, a new point of view. As such, traditional programmers can't just use it without guidance. But it doesn't take years – or even months – to begin using it.

In one sense, object-oriented programming is as old as programming itself. It codifies clever strategies hard won over the decades into a new, coherent whole. It goes beyond those strategies to suggest new ways of viewing the process of programming and of its result. (See "Object Lessons," *NeXTWORLD* Spring 1992, for background on object-oriented programming.)

The object-oriented approach promises to help programmers simply and quickly create programs that are easier to read, comprehend, maintain, and reuse. These promises translate into four key goals:

Modularity. Programs are broken into small, comprehensible pieces that can be easily combined and reused in later programs.

Factoring. Each parameter and code fragment appears in one and only one place, to ease modification and later enhancement.

Encapsulation. Information in the program is kept near the parts of the program that manipulate that information, making it easier to change its representation.

Abstraction. Implementation details are kept hidden from the higher-levels of the program, so later changes at lower levels do not affect the rest of the program.

Object-oriented programming, though, differs in the approach it takes. Rather than requiring separate language facilities to achieve each of these goals, an object-orientated language's basic elements perform double duty, allowing programmers to restructure the way they think and program.

What is an object, anyway?

The fundamental unit of an object-oriented program is the object. Objects contain all the information about one small part of the program and all the procedures allowed to manipulate that information. This achieves part of the modularity, factoring, and encapsulation goals right away.

An object is also an instance (or member) of a class, which describes all the common behavior of its members. For example, NeXTstep objects in the class called Window display information on the NeXT computer's screen. Each window on the screen is represented by a different member, or instance, of the Window class.

Every class defines a set of messages that objects of that class can receive. Simple messages, like commands, tell objects what to do. If the programmer sends an **orderOut:** message to a window, for example, the window takes itself off the screen. Sending the window the message **orderFront:** puts the window on top of all of the other windows on the screen. Inside the object, a procedure (called a method) acts to carry out the message.

Much of an object-oriented program consists of objects sending messages to each other, and returning other objects as the result of those messages. Since all of the information is inside objects, and the only access to that information is through messages, we have both encapsulated and abstracted that information at the same time. Other objects can refer to

the information by a message name, without knowing how that information is actually stored – or even where. This model generalizes naturally to messaging over a network, and to parallel computations.

Objective-C arranges its classes into a tree hierarchy, in which every class inherits the properties of its parent, or superclass, and is then free to make changes to the parent's behavior. For example, the NeXTstep Panel class is a subclass of the Window class. Panels are like windows except

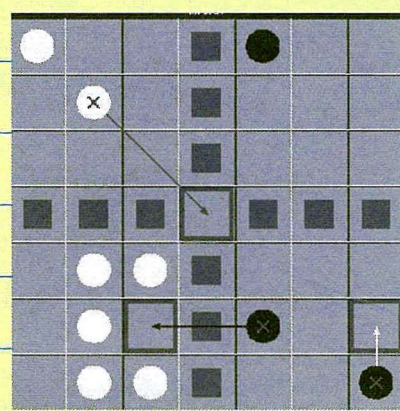


Figure 1 – The Rules of Ergo

Three legal moves are shown at left: White jumps (grey arrow), black replicates (white arrow), or black jumps and captures (black arrow). After the latter, all six pieces in the lower left quadrant would be black.

they are removed from the screen when the user clicks the mouse on another application, and they reappear on the screen when the user clicks the mouse on the Panel's application. The Panel class is itself subclassed to make the NeXTstep Menu class. Menus are like Panels, except they always float on top of all other windows, contain a set of menu cells, and can be made into submenus of other menus. Inheritance can contribute to all four goals.

Thinking like an object

Objects in the world around us are defined by their interactions – pull a doorknob and the door opens; drop a glass and it breaks. This simple model also underlies all object-oriented languages. If an application's goals represent tasks in the real world – like simulating an airplane, for example – then they can be naturally implemented in an object-oriented way. One class of object could represent the landing gear, another the fuel tank, and so on. When the simulation runs, the objects all interact by sending messages to each other, and the virtual airplane flies.

Surprisingly, many traditional computer applications can be thought of in the same way. Within any NeXTstep application, for example, each object that is visible on the screen – each object you can touch with the mouse – has an underlying object associated with it that "feels" your touch. When a button is pressed, a message called **mouseDown:** is sent to a button object, which then sends another message to its target object to carry out the requested action. It is the interaction of these active objects – each knowing how to display itself, modify itself, and interact with the other objects on the screen – that creates the whole NeXT environment.

Ergo, a game

Ergo is an implementation of a simple board game from a video arcade. The program is simple enough to be implemented quickly, yet clearly shows many of the characteristics of good object-oriented design.

Ergo is a little like Go, Othello, and Reversi. Players take turns moving a piece of their color either one or two squares at a time. A one-square move replicates the old piece, creating a new piece in the new square (see Figure 1). Two-square moves are jumps; the moving piece does not stay behind, but travels into the new square. A piece can't land on a square that

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PHOTOGRAPHS BY DAVID MAGNUSSON

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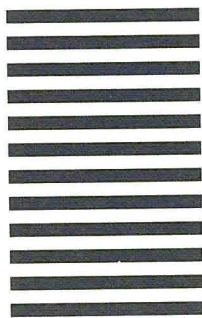
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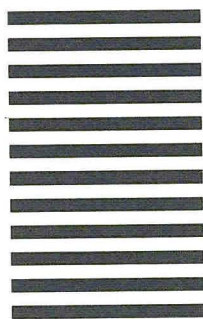
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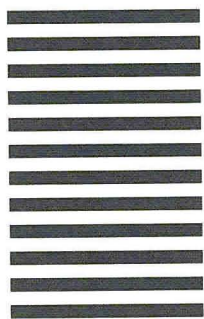
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is blocked or otherwise occupied (it can, however, jump over such squares). If, in its new position, the moved piece is directly adjacent to pieces of the opposite color, it captures those pieces by switching them to its color.

Whenever you design a new NeXT application, always start by designing the most important part: the user interface. Often, you will have a good idea of what behavior you want for your users but an unclear idea of the internal details. In addition, Interface Builder is an excellent sandbox for trying out ideas and throwing out the bad ones without wasting much effort. Interface Builder will also create and organize all the files you'll need to build and maintain your application over time, so starting there makes sense.

In this case, the interface is dictated by the game we are writing. There must be a game board (a Window) and a whole array of squares, some filled and others not (see Figure 2 at right). To move, the user clicks the mouse in a filled square, drags it to an empty square and releases the button, changing an empty square into a filled one. Each square should "feel" the mouse and know whether or not it is filled and whether it can legally be part of the current move. (Notice that we have already begun to somewhat personify the squares, thinking of them as separate, active participants in the game. This is a valuable way to think about the communication between the parts of most object-oriented programs.)

The next step is to think about the various classes of objects we will have in the game; finding natural classes is the most important step in the design effort. If you feel uncomfortable with the choices that you've made, scrap them and start over. It's always better to begin anew than to stick with classes that don't naturally fit your problem.

Since we want to represent the whole board, and some squares on the board have no pieces, we probably want our most abstract "piece objects" to be the squares of the board rather than the pieces. This allows us to have both empty and filled squares. Some squares cannot contain pieces — they're blocked — and they form a third class of square. Finally, filled squares can contain either black or white pieces. The resulting class hierarchy is shown in Figure 3.

Notice that to represent the squares of the game board, we've created a new class: AbstractSquare, from which all other square classes will inherit characteristics. AbstractSquare is a subclass of the NeXT AppKit class called View. As a View subclass, objects of the class AbstractSquare (or any of its subclasses) will automatically be able to receive mouse events and draw themselves in windows.

Once you have a hierarchy of classes, the next step in designing any application is to flesh it out with a protocol of key messages that the objects will use for communication and that will drive the action of the application. Look at the protocol for Ergo in Figure 3. From the density of messages, you can see that the design focuses most of the behavior in the Abstract classes, some in ErgoApp (our subclass of the AppKit's Application object), and very little in the other peripheral classes, which will mostly inherit their behavior from their superclasses. Cooperation between objects from these various classes will drive the game forward.

Mouse behavior is mostly handled by the class AbstractFilledSquare, which we would expect since game moves involve manipulating filled squares. Note that the processes of capturing, checking adjacent squares, taking turns, and distinguishing between black and white squares are all suggested even within the simple protocol of Figure 3.

Finally, we must flesh out the details of the design by implementing it.

Learning the tricks and idioms of object-oriented implementation is a matter of experience, but having a natural hierarchy of classes and a sense of freedom about the patterns of message-passing that you will allow between your objects takes you far along the road. In examining the parts of the implementation presented below, you can read between the lines to get a feeling for how the design choices were made. The results will often suggest the approaches underlying them.

Details, details

When any NeXTstep application begins, the program's Application object (or in this case, the program's ErgoApp object) automatically gets sent the **appDidInit:** message (see Listing 1). ErgoApp's **appDidInit:** method sets who goes first (white) and asks all of the squares on the board to initialize themselves by sending each square the same message. This distribution of a function across a whole set of objects is a common theme in object-oriented programming, and it is done often enough to provide a general message for it: **makeSquaresPerform:**.

The method for **makeSquaresPerform:** works because every square on the board — every View — is really a subview of the master View object that displays the board's window, called the contentView. Every View keeps a List of all of its subviews; to get that List, we simply send that View the **subviews** message. That's what the method for **viewList** in ErgoApp does. Since all the Views we have in the window are squares, this will forward the message to all the squares on the board.

In general, the squares in the Ergo game communicate by broadcasting their messages to every square on the playing board; the only squares that actually do anything are those that can help advance the task at hand. For example, most squares will respond to the broadcast message **appDidInit** by setting a tracking rectangle for themselves (see Listing 2), but BlockedSquares (see Listing 4) will do nothing.

Setting a tracking rectangle is the way to tell the WindowServer that you want to be told when the mouse enters and exits a particular region on the screen. Tracking rectangles let a View receive **mouseEntered:** and **mouseExited:** messages in addition to the usual **mouseDown:** and **mouseUp:** messages received as the user moves and presses the mouse in the View. Since BlockedSquares never wants to receive such messages (it doesn't matter if you move the mouse into a BlockedSquare), they simply override the default **appDidInit** to not set a tracking rectangle.

Once the tracking rectangles have been set, the rest of the game is entirely event-driven: Only when the user moves into a View or presses the mouse will anything further happen.

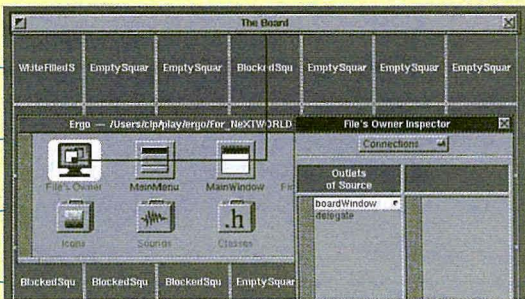


Figure 2 — Creating a User Interface for Ergo
In Interface Builder, a large Window called The Board was created, as were a whole set of new subclasses of View. These classes had no contents yet, but were created so their names could be used as labels. Next, a whole array of CustomViews were pulled off the palette, named, and placed to form the squares of the board. (Each square will compute its row and column from where it is located in the window.) A subclass of Application, called ErgoApp, was created with a single outlet for holding onto the boardWindow (shown connected above) and was then made the File's Owner. Finally, Interface Builder was used to create prototype .h and .m files for all the new classes to start off their implementation.

Make your move

To understand the handling of a move, you should know that each square can be highlighted, and each filled square can be selected.

Highlighting means that a square can participate in the current move: A square automatically highlights when you move the mouse into a valid move. Highlighting is shown visually as a band of gray just inside the square's border. Selection indicates that a square contains the piece that is trying to move during this turn. It is shown visually as a large gray "X" in the center of the square.

As the user moves the mouse, all filled squares of the right color highlight when passed over. AbstractFilledSquare's method for **mouseEntered:** implements this behavior (see Listing 3). As long as either the square is selected, or it is the proper color and nothing is selected, the square will highlight itself. The actual highlighting is done by AbstractSquare's method for **setIsHighlighted:** (Listing 2), which sets the proper state, records it globally if necessary, and then redisplay the square (self) to show the new gray band (see the method for **drawSelf:**). This globally recorded state, handled by our application object (NXApp), is one of only two or three small bits of state information we were unable to distribute across the squares. Listing 2 also contains the default **mouseExited:** implementation, which, if highlighted, unhighlights the square. Placing this here allows the two subclasses below that use mouse movement to share this one implementation.

When the user clicks on the mouse button, any non-filled squares will ignore it (since they don't implement a **mouseDown:** method). But properly colored filled squares will handle a **mouseDown:** message (Listing 3) by selecting themselves. When the **setIsSelected:** message is sent, another piece of globally recorded state is changed. When the mouse now moves about, filled squares will again receive **mouseEntered:** messages, but this time **isSomeoneSelected** (Listing 1) will be true, so only the originally selected filled square will highlight (allowing a player to drop the piece back on the original square).

Now we would like all legal empty squares to highlight themselves so the user can see the legal squares to move to. For this, the other implementation of **mouseEntered:**, in EmptySquare (Listing 4), becomes important. In that method, the empty square asks all squares to check their adjacency with itself. If one of them finds that it is adjacent and has a legal move to the empty square sending the message, it will send that empty square back the message **foundAdjacent** (just below in Listing 4). This, in turn, causes that empty square (where we started) to highlight itself.

To see how **checkAdjacencyWith:** works, we'll begin in AbstractSquare (Listing 2). Most squares simply ignore the message. However, filled squares (Listing 3) override that version to ask themselves, "Am I selected and am I two squares away (or less) from the sender?" An affirmative answer means that the filled square has a legal move to the sending empty square, and it tells the empty square so. The empty square may get many affirmative answers, but this won't matter.

The user, who is still holding down and moving the mouse, can now see all the legal moves. Eventually the user releases the mouse button, which always sends a **mouseUp:** message to the same object that received the **mouseDown:**. This has to be a filled square. Thus, the rest of the rules of the game are implemented in the method for **mouseUp:** (Listing 3).

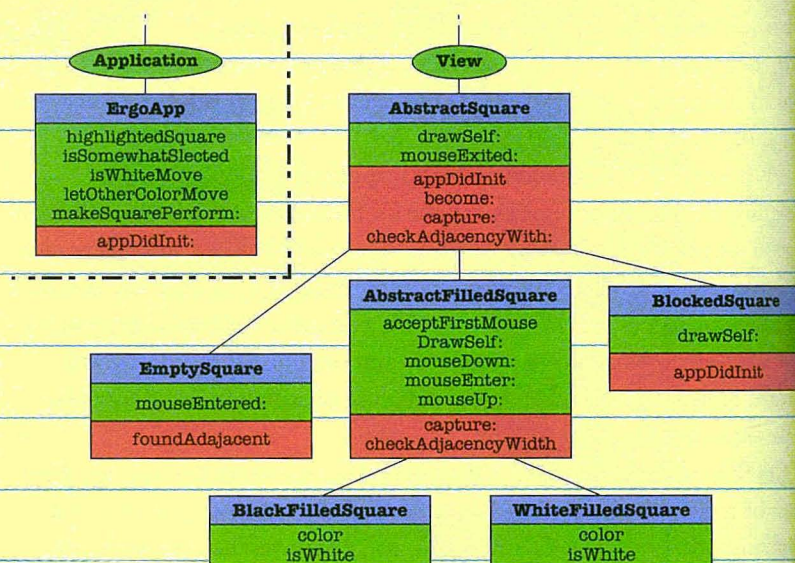


Figure 3 - The Class Hierarchy and Protocol of Ergo

Each class (box) above is titled with its class name, is connected to its superclass, and is filled with the names of its key messages (these messages appear in bold in Listings 1-4). All of Ergo's classes are subclasses of View or Application, standard AppKit classes. (Most of the work of Ergo has already been done for us by NeXT, in the AppKit.) Classes with the prefix Abstract store common behavior but by convention do not expect to have instances. (EmptySquare objects will appear in a running copy of Ergo, but AbstractSquare objects will not.) The distinction between messages grouped in the upper rectangle of a class and the lower one is that the upper messages are thought of as being public, available to any and all other objects, whereas the lower messages are private, and are useful only to the other objects in Ergo that directly need them. This distinction is a useful comment to later readers of your object about which messages you consider safe for common use, and which may have undocumented side effects.

Mouse up!

When the mouse is released, the square that the user wanted to move into should still be highlighted. If that square is the same square that received the **mouseUp:** message, we do nothing - this is not a move, since the user pressed and released the mouse in the same square.

Otherwise, if the EmptySquare is still highlighted, we can perform a legal move. First, we remember the class of the highlighted square and how far we are away from it. Then we ask all the squares to perform a **capture:** with the highlighted square (an EmptySquare), after we have made it **become:** the same class that we are (this makes it a filled square of our color). We'll explore capturing in a moment. If we have jumped from more than one square away, we must vacate our old location (we **become:** the class of the empty square we just moved to, that is, we become empty). Otherwise, we need only deselect ourselves and stay where we are (we have replicated ourselves). Finally, we ask the ErgoApp object to **letOtherColorMove.**

The last two details of a move are capturing and taking turns. Most squares do nothing for a **capture:** (Listing 2). In AbstractFilledSquare (Listing 3), though, a filled square tests whether it should be captured by the sender, a matter of being a different color (class) and of being exactly one square away. If it should be captured, it will **become:** the same class as the sender (change to the sender's color). Many filled squares can be captured by the same sender in this way. It is a rather simple and elegant way to express the capture rule.

Turn-taking is handled by ErgoApp (Listing 1) via the message **letOtherColorMove.** The implementation inverts the answer that **isWhiteMove** will return and simply redisplay the board. Turn-taking alternates forever, since this version of the method does not check for the end of the game (see the sidebar on "Extending Ergo"). →

A 60-Second Intro to Objective-C

Objective-C is a hybrid of the and C. It starts with full C o adds a new data type and a The new data type is ca to Any kind of object, the we pointer to any kind of struct The new syntax for def like this:

```
@implementation ASillyClass
/* starts a class definition */

- (int) add: (int) aNumber to
return aNumber + anot
}

- print: (int) someNumber {
printf("%d\n", someNu
return self;
} /* self is the object that
@end /* ends a class def
```

Individual methods beg The first method takes two the result of them added tog method prints the value of i "returns self," a common id Use a pair of square br sage to an Objective-C object using the above class:

```
/* make an object of class A
id obj = [[ASillyClass alloc]
int x=3, y=4, z;

z = [obj add: x to: y];
printf("%d plus %d is ", x,
[obj print: z];
```

In the first line above, the result of the previous mon shorthand (e.g., [self can also embed Objective-C C expressions:

```
z = 14 / [obj add: x to: y];
```

By convention, Objectiv capital letters to begin the r use lower case letters to be sages and variables.

Although there is much this small introduction sho started reading Listings 1-4

Listing 1 - ErgoApp

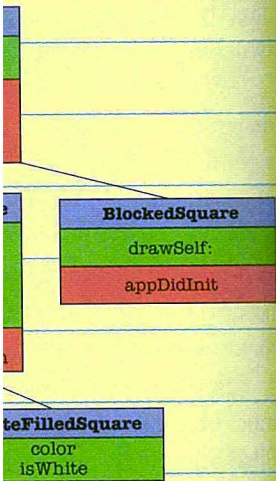
Each **Class.m** file looks the essary **.h** files, define a seq tions for public messages in then the private messages. protocol will appear in bold appear in italics. Good obje is convoluted by its very ne search back and forth acro read through the tutorial. Z environment makes followi methods trivial, but the lin prevents us from doing so.

```
File: ErgoApp.m
#import "ErgoApp.h"
#import <appkit/View.h>
#import <obj/List.h>
```

```
@implementation ErgoApp
```

```
- highlightedSquare {
return highlightedSqu
}
```

```
(BOOL) isSomeoneSelecte
return isSomeoneSelec
}
```

o
ted to its superclass, and is
bear in bold in Listings 1-4).
standard AppKit classes.
NeXT, in the AppKit.)
t by convention do not
in a running copy of Ergo,
n messages grouped in the
r messages are thought of as
the lower messages are pri-
rectly need them. This dis-
about which messages you
mented side effects.

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not a move, since the user
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Square), after we have
s makes it a filled square
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moved to, that is, we
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ally, we ask the ErgoApp

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ass) and of being exactly
become: the same class
y filled squares can be
rather simple and elegant

1) via the message
erts the answer that
s the board. Turn-taking
od does not check for the
Ergo"). →

A 60-Second Introduction to Objective-C

Objective-C is a hybrid of the languages SmallTalk and C. It starts with full C compatibility, and then adds a new data type and a way to define classes. The new data type is called **id**; it is a pointer to any kind of object, the way C's **void *** is a pointer to any kind of structure. The new syntax for defining classes looks like this:

```
@implementation ASillyClass
/* starts a class definition */

- (int) add: (int) aNumber to: (int) anotherNumber {
    return aNumber + anotherNumber;
}

- print: (int) someNumber {
    printf("%d\n", someNumber);
    return self;
}

/* self is the object that was sent the message */
@end /* ends a class definition */
```

Individual methods begin with a dash ("."). The first method takes two numbers and returns the result of them added together. The second method prints the value of its argument and "returns self," a common idiom.

Use a pair of square brackets to send a message to an Objective-C object. Here is an example, using the above class:

```
/* make an object of class ASillyClass */
id obj = [[ASillyClass alloc] init];
int x=3, y=4, z;

z = [obj add: x to: y];
printf("%d plus %d is ", x, y);
[obj print: z];
```

In the first line above, a message was sent to the result of the previous message; this is a common shorthand (e.g., `[[self doThis] doThat]`). You can also embed Objective-C messages inside regular C expressions:

```
z = 14 / [obj add: x to: y];
```

By convention, Objective-C programmers use capital letters to begin the names of classes and use lower case letters to begin the names of messages and variables.

Although there is much more to Objective-C, this small introduction should be enough to get you started reading Listings 1-4.

Listing 1 - ErgoApp

Each **Class.m** file looks the same: Import the necessary **.h** files, define a sequence of implementations for public messages in alphabetical order, then the private messages. Key messages in Ergo's protocol will appear in bold, while comments will appear in italics. Good object-oriented programming is convoluted by its very nature, so expect to search back and forth across these listings as you read through the tutorial. A good object-oriented environment makes following these links between methods trivial, but the linear layout of text here prevents us from doing so.

```
File: ErgoApp.m
#import "ErgoApp.h"
#import <appkit/View.h>
#import <objc/List.h>
```

```
@implementation ErgoApp

- highlightedSquare {
    return highlightedSquare;
}

- (BOOL) isSomeoneSelected {
    return isSomeoneSelected;
}
```

```
- (BOOL) isWhiteMove {
    return isWhiteMove;
}

- letOtherColorMove {
    [self setIsWhiteMove: ![self isWhiteMove]];
    return [boardWindow display];
}

- makeSquaresPerform: (SEL) aMessage {
    return [[self viewList] makeObjectsPerform:
        aMessage];
}

- makeSquaresPerform: (SEL) aMessage with:
    sender {
    return [[self viewList] makeObjectsPerform:
        aMessage with: sender];
}

- setHighlightedSquare: aSquare {
    highlightedSquare = aSquare;
    return self;
}

- setIsSomeoneSelected: (BOOL) state {
    isSomeoneSelected = state;
    return self;
}

- setIsWhiteMove: (BOOL) state {
    isWhiteMove = state;
    return self;
}

/* Private methods: */
- appDidInit: sender {
    isWhiteMove = YES;
    return [self makeSquaresPerform:
        @selector(appDidInit)];
}

/* our return value is ignored, so any is OK */
- viewList {
    return [[boardWindow contentView] subviews];
}

@end
```

Listing 2 - AbstractSquare

Here we show both the **.h** and **.m** files for AbstractSquare. Note that several commonly used files are imported in the **.h** file. This allows all subclasses of this abstract class to import them automatically without thinking about it, since each subclass will ultimately import **AbstractSquare.h**. Note, too, the declaration of some local state information for holding the square's row, column, etc. These are instance variables, which can hold different values in each instance (object) of the AbstractSquare class (or any of its subclasses). AbstractSquare is the most general of the classes implementing Ergo squares.

```
File: AbstractSquare.h
#import "ErgoApp.h"
#import <appkit/View.h>
#import <appkit/nextstd.h>
#import <dpsclient/psops.h>
```

```
@interface AbstractSquare : View {
    short    row, column;
    BOOL     isHighlighted;
    int      trackingRectNumber;
}

- (short) column;
- (short) distanceTo: otherSquare;
- drawSelf: (const NXRect *) rects : (int) rectCount;
- (BOOL) isHighlighted;
- mouseExited: (NXEvent *) theEvent;
- (short) row;
- setIsHighlighted: (BOOL) state;

/* Private methods: */
- appDidInit;
- appDidInitInside: (BOOL) state;
- become: newSquareClass;
- capture: sender;
- checkAdjacencyWith: sender;
- free;
- freeTrackingRect;
- highlight: (const NXRect *) aRect;
- initWithFrame: (const NXRect *) frameRect;
- setTrackingRect: (const NXRect *) aRect inside:
    (BOOL) state;

@end
```

```
File: AbstractSquare.m
#import "AbstractSquare.h"

@implementation AbstractSquare

- (short) column {
    return column;
}

- (short) distanceTo: otherSquare {
    return MAX (ABS([self row ]
        - [otherSquare row ]),
        ABS([self column]
        - [otherSquare column]));
}

- drawSelf: (const NXRect *) rects : (int) rectCount {
    [super drawSelf: rects : rectCount];
    NXDrawGrayBezel(&bounds, rects);
    if ([self isHighlighted])
        [self highlight: rects];
    return self;
}

- (BOOL) isHighlighted {
    return isHighlighted;
}

- mouseExited: (NXEvent *) theEvent {
    if ([self isHighlighted])
        [self setIsHighlighted: NO];
    return self;
}

- (short) row {
    return row;
}

- setIsHighlighted: (BOOL) state {
    if (isHighlighted == state)
        [NXApp setHighlightedSquare: self];
    return [self display];
}

/* Private methods: */
- appDidInit {
    return [self appDidInitInside: NO];
}

- appDidInitInside: (BOOL) state {
    return [self setTrackingRect: &frame inside:
        state];
}

- become: newSquareClass {
    BOOL wasHighlighted = [self isHighlighted];
    id theSuperview = [self superview];
    id newSquare = [[newSquareClass alloc]
        initWithFrame: &frame];

    [[[self freeTrackingRect]
        removeFromSuperview] free];
    [theSuperview addSubview: newSquare];
    return [newSquare appDidInitInside:
        wasHighlighted];
}

- capture: sender {
    return self;
}

- checkAdjacencyWith: sender {
    return self;
}

- free {
    if ([self isHighlighted])
        [NXApp setHighlightedSquare: nil];
    return [super free];
}

- freeTrackingRect {
    if (trackingRectNumber > 0)
        [[self window] discardTrackingRect:
            trackingRectNumber];
    return self;
}

#define INSET 2
#define WIDTH 7

- highlight: (const NXRect *) aRect {
    NXRect theRect = *aRect;

    NXInsetRect(&theRect, INSET, INSET);
    PSsetGray(NX_DKGRAY);
    NXFrameRectWithWidth(&theRect, WIDTH);
    return self;
}

- initWithFrame: (const NXRect *) frameRect {
    [super initWithFrame: frameRect];
    /* the below only works with small borders */
}
```



```
row = frameRect->origin.y /
frameRect->size.height;
column = frameRect->origin.x /
frameRect->size.width;
return self;
}
- setTrackingRect: (const NXRect *) aRect inside:
(BOOL) state {
static int rectNumber = 1;
NXRect winRect = *aRect;

trackingRectNumber = rectNumber;
[[self superview] convertRect: &winRect
toView: nil];
[[self window] setTrackingRect: &winRect
inside: state /* cursor is in/out */
owner: self tag: rectNumber++
left: NO right: NO];

return self;
}
@end
```

Listing 3 – AbstractFilledSquare

This class is an important one. Most mouse-event-driven messages are dispatched into this class, and all legal moves begin here.

```
File: AbstractFilledSquare.m
#import "AbstractFilledSquare.h"
#import "EmptySquare.h"
/* for foundAdjacent message declaration */

@implementation AbstractFilledSquare

- (BOOL) acceptsFirstMouse {
return YES;
}

- (float) color {
return [self subclassResponsibility: _cmd], 0;
}
/* “, 0” for -Wall */
#define FRACTION 0.6

- drawSelf: (const NXRect *) rects : (int) rectCount {
double cx = NX_MIDX(&bounds),
cy = NX_MIDY(&bounds);

[super drawSelf: rects : rectCount];
PSsetgray([self color]);
PSarc(cx, cy, FRACTION *
bounds.size.width / 2, 0, 360);
PSfill( );
if ([self isSelected])
[self select: cx : cy];
return self;
}

- (BOOL) isMyMove {
return [NXApp isWhiteMove] == [self isWhite];
}

- (BOOL) isSelected {
return isSelected;
}

- (BOOL) isWhite {
return [self subclassResponsibility: _cmd], NO;
}

- mouseDown: (NXEvent *) theEvent {
if ([self isMyMove])
[self setIsSelected: YES];
return self;
}

- mouseEntered: (NXEvent *) theEvent {
if ([self isSelected] || ([self isMyMove]
&& ![NXApp isSomeoneSelected]))
[self setIsHighlighted: YES];
return self;
}
/* above, could check if ANY move is legal */
- mouseUp: (NXEvent *) theEvent {
id emptySquare = [NXApp highlightedSquare];

if (self != emptySquare && [self isSelected]
&& [emptySquare isHighlighted]) {
id emptyClass = [emptySquare class];
short jump = [self distanceTo:
emptySquare];
```

```
[NXApp makeSquaresPerform:
(selector(capture:)
with: [emptySquare become:
[self class]]);

if (jump > 1)
[self become: emptyClass];
else
[self setIsSelected: NO];
return [NXApp letOtherColorMove];
}
/* above, hope ANY return value is OK */
return [self setIsSelected: NO];
}

- setIsSelected: (BOOL) state {
[NXApp setIsSomeoneSelected:
isSelected = state];

return [self display];
}

/* Private methods: */
- capture: sender {
if ([self class] != [sender class]
&& [self distanceTo: sender] == 1)
return [self become: [sender class]];
return self;
}

- checkAdjacencyWith: sender {
if ([self isSelected] && [self distanceTo: sender]
<= 2)

[sender foundAdjacent];
return self;
}
/* can extend above for a toroidal board */

- free {
if ([self isSelected])
[NXApp setIsSomeoneSelected: NO];
return [super free];
}
/* below should really be a % of width */
#define X_OFFSET 9
#define X_WIDTH 4

- select: (double) cx : (double) cy {
PSsetgray(NX_DKGRAY);
PSsetlinewidth(X_WIDTH);
PSmoveto( cx - X_OFFSET, cy + X_OFFSET );
PSlineto( cx + X_OFFSET, cy - X_OFFSET );
PSmoveto( cx + X_OFFSET, cy + X_OFFSET );
PSlineto( cx - X_OFFSET, cy - X_OFFSET );
PSstroke( );
return self;
}
@end
```

Listing 4 – The Peripheral Classes

Here are all the peripheral classes that implement Ergo squares. They inherit almost all their behavior from their superclasses, and are the real examples of the power of inheritance. Almost nothing needs to be done in their implementations; the class hierarchy of Ergo does all the work.

```
File: EmptySquare.m
#import "EmptySquare.h"

@implementation EmptySquare

- mouseEntered: (NXEvent *) theEvent {
[NXApp makeSquaresPerform:
(selector(checkAdjacencyWith:)
with: self);

return self;
}
/* above, don't do return [...]; someone may
depend on return self */

/* Private methods: */
- foundAdjacent {
return [self setIsHighlighted: YES];
}
/* we were found to be adjacent by the above */
@end

File: BlockedSquare.m
#import "BlockedSquare.h"

@implementation BlockedSquare
```

```
#define FRACTION 0.5
#define BORDER ((1 - FRACTION) / 2)

- drawSelf: (const NXRect *) rects : (int) rectCount {
NXRect block = { bounds.origin.x + BORDER
* bounds.size.width,
bounds.origin.y + BORDER
* bounds.size.height,
FRACTION * bounds.size.width,
FRACTION * bounds.size.height };

[super drawSelf: rects : rectCount];
PSsetgray(NX_DKGRAY);
NXRectFill(&block);
return self;
}
/* Private methods: */
- appDidInit {
return self;
}
/* does nothing (sets no tracking rectangle) */
@end

File: BlackFilledSquare.m
#import "BlackFilledSquare.h"

@implementation BlackFilledSquare

- (float) color {
return NX_BLACK;
}

- (BOOL) isWhite {
return NO;
}
@end

File: WhiteFilledSquare.m
#import "WhiteFilledSquare.h"

@implementation WhiteFilledSquare

- (float) color {
return NX_WHITE;
}

- (BOOL) isWhite {
return YES;
}
@end
```

Extending Ergo, or How to Get Your Own Copy

Face it: Ergo needs work. The game should display the number of white- and black-filled squares after each move, detect the end of the game, have a clock to limit the total time taken by each player, have sound effects and music, and more. Each of these extensions is extremely easy to add to the existing structure of Ergo, if you think in an object-oriented way.

Some interesting extensions to the game have already been included in the versions of Ergo you can get below. These include an Interface Builder palette-based version of Ergo, in which new boards can be created in seconds from a palette of pieces, and a version that allows multiple boards to be loaded at once. All the versions of Ergo below come with additional comments and the full sources (all the .m, .h, .nib, etc. files).

If you have ftp access to the Internet, Ergo is available in all of the main archive sites (cs.orst.edu and sonata.cc.purdue.edu are two). If you have only e-mail access, send a message with the subject “help” to the address archive-server@cc.purdue.edu and follow the instructions mailed back. If this fails send a message to ergo@nextworld.com asking for Ergo and we will send you a copy. Floppy disks will be available on a limited basis: Write to Ergo Floppy Offer, NeXTWORLD Magazine, 501 Second St., San Francisco, CA 94107. If all else fails, you can type in the source code included in Listings 1–4. It is a complete listing of Ergo (except for a few trivial .h files that are mirrors of the .m files). Use Figure 2 to help you create the .nib file.

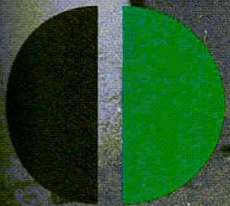
→ Getting With the Progr

On becoming

When programming in an arise in which one object w the objects will simply swi interesting implementation square, we record and pass the square, but assign them unusual move, the original free message) and returns

The final point of som classes BlackFilledSquare a instance-dependent variabl class hierarchy to store the WhiteFilledSquare, the col BlackFilledSquare the same effect: Classes added later c changing the rest of Ergo.

Hiding an object’s stat but there is power in the al response as a state-variable it is here). Any of these im the protocol of messages w changes, nothing would ha the color message. Flexibili



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415-326-2974


```
FRACTION) / 2)
; *) rects : (int) rectCount {
nds.origin.x + BORDER
* bounds.size.width,
nds.origin.y + BORDER
* bounds.size.height,
TON * bounds.size.width,
TON * bounds.size.height };
s : rectCount];
AY);
```

```
no tracking rectangle) */
n
are.h"
illedSquare
```

```
m
are.h"
illedSquare
```

or How to Get Your

The game should display
d black-filled squares after
d of the game, have a clock
ken by each player, have
, and more. Each of these
easy to add to the existing
think in an object-oriented

tensions to the game have
the versions of Ergo you
lude an Interface Builder
Ergo, in which new boards
is from a palette of pieces,
rs multiple boards to be
versions of Ergo below come
ts and the full sources (all
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azine, 501 Second St., San
all else fails, you can type
ded in Listings 1-4. It is a
(except for a few trivial .h
f the .m files). Use Figure 2
nib file.

→ Getting With the Program

On becoming

When programming in an object-oriented language, situations frequently arise in which one object wants to literally become another object. Often the objects will simply switch identities. Our **become:** (Listing 2) has an interesting implementation. Since we want to preserve the “identity” of the square, we record and pass along all the state information associated with the square, but assign them to a square of an entirely different class. In an unusual move, the original object then frees itself (by sending itself the **free** message) and returns the newly created object in its place.

The final point of some interest is the implementation of the subclasses **BlackFilledSquare** and **WhiteFilledSquare**. Rather than having an instance-dependent variable hold the black/white distinction, we use the class hierarchy to store the information directly. For example, in class **WhiteFilledSquare**, the **color** message returns **NX_WHITE** explicitly; in **BlackFilledSquare** the same message returns **NX_BLACK**. One nice side effect: Classes added later can choose to return a shade of gray without changing the rest of Ergo.

Hiding an object’s state behind messages may seem frivolous at first, but there is power in the abstraction: We can choose to implement **color**’s response as a state-variable lookup, a computed value, or as a constant (as it is here). Any of these implementations would behave identically under the protocol of messages we have defined; if the way **color** is implemented changes, nothing would have to be changed in the other objects that use the color message. Flexibility like this, which enhances the reusability of a

class, begins to demonstrate the important benefits object orientation brings to application development, maintenance, and reuse.

The winning way


Whenever you design an application, start by asking yourself how the tasks could best be broken up and distributed to a whole host of small, cooperating objects, each of which does one thing well.

Whenever you set out to design an object for your application, ask yourself what other purposes it could be used for, how best it could be extended to more fully generalize the one function needed today, and what implementation will be clean and clear enough that you will be able to reuse it in the future.

The simple classes in Ergo have each tried to live up to these standards. As a bonus, you may discover that your application itself is now general enough to be reused by your users within the larger NeXT environment. Good object-oriented design can be applied at all levels.

Object-oriented thinking can help you achieve simple, natural, and elegant solutions. The old 90/10 rule should tell you that most of your program can afford the abstraction and clarity that a high-level, object-oriented design will bring. Don’t settle for the familiar or traditional; that leads to programs that are unique, fragile, and difficult to share. Use object-oriented programming for your next project, and begin to build for the future. ♦

CHARLES L. PERKINS, a contributing editor to NeXTWORLD, has been a registered NeXT developer for the past three years.



Creative Genius

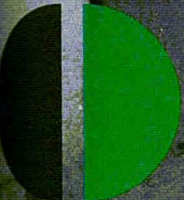
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Remember when punk rock and 1200-baud modems were hot? The Hayes Smart modem could move data four times faster than most other modems then on the market. But these days, high-speed modems let users pump 19,200 – or more – bits per second over ordinary telephone lines using a variety of signal-processing and data-compression techniques.

Fast forward ten years: Punk rock is still dead and modems are faster still. But who uses modems anymore? By the turn of the century, anyone who is serious about data communications is “jacking in” – connecting their computer directly to the phone company’s digital network and moving data at megabits (Mbits) per second.

Sound like cyberpunk? It’s not. It’s a new system for digital communications called ISDN. And it’s here today, initially offering speeds of 128Kbits per second for less than \$400, if you have a NeXT.

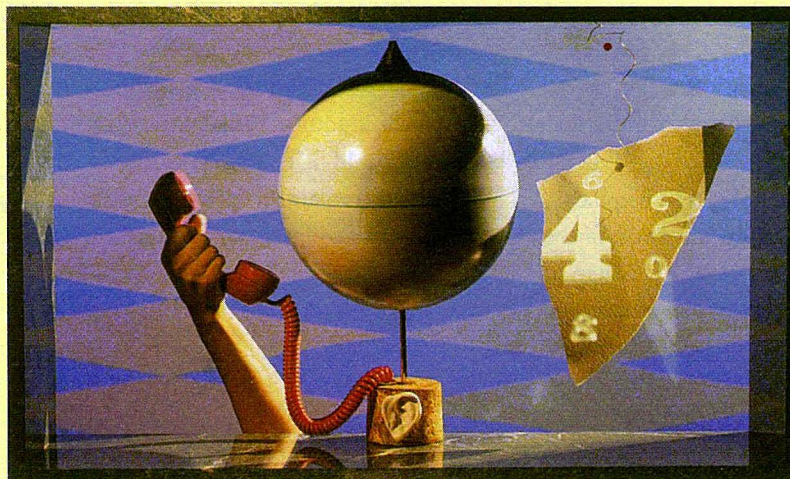
Innovative Standards Doing Nothing

For years, ISDN has been a pie-in-the-sky future for telecommunications junkies. The acronym, which stands for Integrated Services Digital Network, promised a direct digital interface between the telephone company’s central office and the customer. ISDN was to do the same thing for telephones that compact discs did for music: By sending sound to the customer as a digitized stream, ISDN would simultaneously improve the phone system’s quality and open up the world of data communications, just as compact discs made CD-ROM possible.

But ISDN has been slow – some say painfully slow – in coming to the U.S. telecommunications market.

Until now, the biggest ISDN users have been telemarketing companies. These firms benefit from ISDN’s dramatically faster “call setup time” – which enables opera-

ISDN



Comes of A g e

If you thought
that modem on your
desk was *f a s t*, hold
on to your hats

by **Simson L. Garfinkel**

tors to make more calls per hour, boosting profits. And while state public utility commissions across the country argue about the merits of Caller-ID, a proposed system that would display the telephone number of an incoming phone call, ISDN subscribers have been quietly enjoying this benefit (renamed ANI, for Automatic Number Identification) for half a decade. Many firms that sell merchandise by telephone use ISDN to get the caller’s phone number to automatically pull up customer records.

In all of these cases, however, ISDN was available only under special arrangement, usually in blocks of dozens, or hundreds, of lines. And the few companies that actually had ISDN couldn’t use it to place a digital phone call from one telephone exchange to another, because the interconnection software, which depended on a new phone system standard, didn’t work properly.

“The fact of the matter is there are about five different versions of ISDN in existence today, with very limited deployment and very limited use,” says Dick Aloia, assistant vice-president of network access technology for Bellcore, the R&D arm of the nation’s regional telephone companies.

All of that is now changing, and NeXT – the only computer company whose every machine comes equipped with a Digital Signal Processor (DSP) – is uniquely poised to take advantage.

Interesting Services, Dream Network

Two years ago, NeXT’s communications gurus were trying to figure out ways to tap into the computing-at-home market.

“We were sitting in a meeting and Steve Jobs said, ‘Go out and make IP [Internet Protocol] run over phone lines as fast as possible – and I want it to run over ISDN,’ ” recalls Tim Kreps, NeXT’s developer advocate for networking and

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Testing Services, Team Network

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YOU HAVE ONE HALF OF THE WORLD'S MOST SOPHISTICATED ELECTRONIC FILING SYSTEM SITTING RIGHT THERE ON YOUR DESK.

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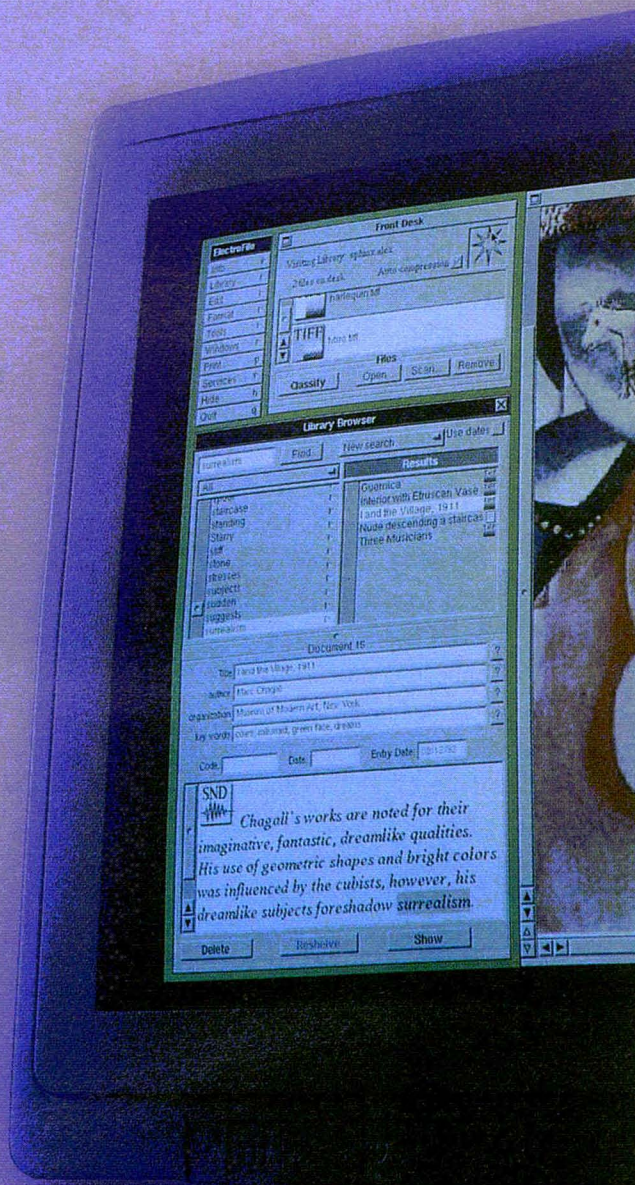
ElectroFile's browser interface lets you design com-
plex search paradigms with just a few key strokes, which
reduces thousands of possibilities down to the right one.
Then, once you've found it, you just click "Show" and there's
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notes or important text, even record messages on your
document. Regardless of the number of pages.

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document library. You might as well. If you have a NeXT,
you're already halfway there.



ELECTROFILE

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communications.

IP is the network standard that NeXT and other UNIX workstations use to communicate over Ethernet. Running IP over ISDN would mean that a person with a NeXT-station at home could access electronic mail, files, and applications at work – doing it quickly and transparently.

The obvious way to make IP run over ISDN was to use the DSP. Ever since NeXT introduced the Cube, engineers both inside and outside the company dreamed of programming the DSP to emulate modems, fax machines, telephone dialers, and voice-mail systems. One engineer even rigged up a demo in which a NeXTcube automatically faxed e-mail to a person out of the office. The time had come to take the best elements of those demos and turn them into a product.

A year later, the group was just finishing off a prototype that was code-named “Babblefish” (the name of the universal translator in *The Hitchhiker’s Guide to the Galaxy*). The box, now being manufactured by Hayes, can connect any NeXT to either a conventional or an ISDN telephone line.

Connecting the box to a regular telephone line produces an answering machine on steroids. It lets you use a NeXT to place and receive telephone calls, generate and decode touch-tone signals, and play and record voice over the phone line. In addition to answering machines and voice mail, developers will be able to use the box to create new information services delivered over regular phone lines to ordinary touch-tone telephones.

But the real benefit comes when you connect the box, now called the Hayes ISDN eXTender, to a digital phone line: It provides a full digital interface to the outside world, capable of transferring data at rates of either 64Kbits/sec or 128Kbits/sec. That’s almost 6.8

times faster than today’s fastest modems – and 3.4 times faster than the maximum possible throughput of the NeXT serial ports (which are limited to a maximum speed of 38,400 baud). And, true to Jobs’s wishes, it will run IP.

The ISDN eXTender is a small box containing an ISDN chip set, for connecting to ISDN lines, and an analog-to-digital, digital-to-analog converter, for connecting to conventional telephone lines. The box has no memory, no CPU, and draws its power directly from the NeXT. Its sole purpose is to bring the signals on the telephone line to the NeXT’s DSP. The rest is done by software.

Because the Hayes box has little intelligence, it’s cheap: With a suggested retail price of \$349, it costs about \$1000 less than other ISDN interfaces. (Hayes’s other ISDN interface, the Hayes ISDN System Adapter, lists at \$1595, largely because it needs to have its own DSP, software, high-speed computer interface, and power supply.) It needs PhoneKit and ISDN-Kit, both standard with NeXTstep Release 3.0, to run.

“We will have some kind of simple configuration application for setting it up,” says Kevin Wells, NeXT’s manager of software products. Users will have to get an Internet address assigned for their computer. After that, “it will be one button [to push] for the base case.”

I See Dollars Now

But what will NeXT users actually do with ISDN? That depends on what they’re doing now.

“ISDN won’t let you do anything that you can’t do already,” says Joe Gustafson, ISDN market planning director for NYNEX, the parent of several Bell operating companies. But in many cases, he adds, it will dramatically lower the cost of high-speed communications.

For example, today it is possible to get a 56Kbits/sec leased line

from the phone company between your home and your office. The cost can be up to \$1000 to install and \$200 to \$300 per month to maintain. Compare that, for example, with an ISDN installation fee of \$15 and a monthly fee of \$8 (in addition to the cost of a standard telephone line) – the tariff just approved for Massachusetts by that state’s Department of Public Utilities. In California, the monthly cost of an ISDN line is less than \$30.

Long-distance ISDN calls will cost the same as current long-distance voice calls; companies like MCI and Sprint already have fully digital networks. Once National ISDN 1 is in place (see sidebar “What’s the ‘D’ stand for?”), the long-distance networks won’t even know the difference between a voice call and a data call.

These dramatically lower costs will open up ISDN for small- and medium-size companies – especially those with branches in different cities. For example, a graphic arts firm with offices in Houston, Chicago, Boston, and San Francisco might use ISDN to transmit digitized images instead of sending slides by Federal Express. With a NeXT at each end, a 26MB image could be transferred coast-to-coast in less than four minutes, and for less than a dollar.

NeXT’s other big ISDN market is likely to be people working at home. “With ISDN, you’re really on-line,” says Eric Bergerson, managing director of Objective Technologies, a New York-based NeXT developer.

With ISDN, says Bergerson, NeXT users will be able to transparently access their files and applications over the telephone. “You won’t have to replicate the entire environment at home.”

ISDN also means improved computer security. A feature called Closed User Group lets the customer specify a list of telephone numbers that are authorized to call

a particular extension; if somebody from outside the user group tries to place a call, they get an error message. That should keep out the computer crackers.

This democratization of ISDN is very different than what telephone companies had planned for the technology in the mid-1980s. Back then, phone company executives “were looking for a killer application that would make everybody want to go out and buy ISDN,” says Robert Toense, vice-chair of applications software interface of the North American ISDN Users Forum, and an electronics engineer at the National Institutes of Standards and Technology.

“People are beginning to come to the realization that no such killer application exists,” says Toense. Instead, it is likely that people will use ISDN the same way they’ve been using modems – only more so.

Innovative Subscribers Desperately Needed

The basic thing that’s been holding back the widespread adoption of ISDN in the United States has been “standards, standards, standards,” says NYNEX’s Gustafson. “We couldn’t do it a few years ago because we hadn’t deployed the technology. We hadn’t agreed on a set of standards.”

For example, regional telephone companies in the United States primarily use switches manufactured by AT&T and Northern Telecom. But until this year, the two companies’ ISDN implementations didn’t work with each other.

It wasn’t until recently that the various players in the U.S. telecommunications market got together and decided upon standards for things as simple as the basic-rate ISDN connector. Until that was done, companies were hesitant to commit the millions of dollars necessary to install new equipment and software. It costs a few hundred thousand dollars to upgrade the

software on a single central switch; the interface cards for a central office for each subscriber line cost \$50 to \$150 each.

Phone company executives imagined their customers using ISDN telephones to get faxes, hold and ANI, and then send data over the course of the day. Instead, connecting the ISDN islands to form one national ISDN network. But customers ended up using ISDN altogether.

“ISDN islands, where each company can talk to itself on its own business premise, isn’t very useful,” says Bellcore’s Aloia. “Cooperation is the thing that the telephone company sells. A large degree of connectivity is the essential element and it has been missing.”

Things have been difficult overseas, primarily because European countries and Japan have their phone systems made up of single companies instead of state-run monopolies. The companies haven’t had problems with software incompatibility because of their telephone switches made by the same vendor.

France is perhaps the furthest along on the road to ISDN. In the late 1970s, France made a commitment to bring its archaic telephone system into the digital age. Now ISDN is available everywhere in the country. Installation costs are low and the monthly fee is \$60 a month. According to Igor Douplitzky, assistant vice-president of new services at France Telecom’s office in New York. More than 150,000 customers have basic-rate ISDN, Douplitzky said.

When more than one company has ISDN, it opens up the possibility of international high-speed calls. “At least 50 U.S. corporations use ISDN between France and the United States,” Douplitzky says. Right now, that list is limited to companies that have made arrangements to use the service. But only for a few more months.

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form one national ISDN system.
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But only for a few more months...

What's the "D" Stand For?

When you pick up your telephone and call a friend, you're actually opening a connection for a stream of information through a high-speed data network called the phone system. When you speak into the telephone, your voice gets turned into an analog voltage that travels down a pair of copper wires to a telephone company central office. There your voice gets digitized. The resulting stream of digital information travels, often by fiber optics, to the central office of the person with whom you are speaking. At the receiving end, your voice gets turned back into an analog stream and sent to your friend's telephone.

When you send data over the phone, your modem changes the stream of ones and zeros into tones. The irony is that as soon as those tones hit the central office, they're digitized. At the other end, they're converted back into tones and then reconverted again into the original digital stream. Taking those detours into the analog world is an error-prone process; the only way to make it work reliably is to use relatively slow speeds and sophisticated error-correcting codes.

ISDN uses the same pair of copper wires between the customer and central office, but instead of sending an analog voltage, it sends a stream of digital pulses. To talk over an ISDN line, you need a special telephone that simultaneously digitizes your voice and plays back the digital stream from the central office. ISDN today comes in three main flavors.

Basic Rate Service (BRS), or 2B+D provides two 64Kbits/sec digital channels for tele-
phone calls and one 16Kbits/sec channel for control signals over a twisted pair of copper wires.
With BRS, you could have two separate conversations at the same time over two different tele-
phone instruments, or speak with a person over one digital channel while transmitting informa-
tion over the other. **1B+D** is a cut-rate form of BRS that gives you one 64Kbit/sec channel.

Primary Rate Service (PRI), or 23B+D is industrial-strength ISDN, delivering 23 "B"
channels (each at 64Kbits/sec) and one "D" channel (also at 64Kbits/sec). You can use all those
"B" channels for 23 separate conversations, or you can bundle them for 1.472 Mbits/sec. If you
buy ISDN directly from a company like Sprint, MCI, or AT&T, this is probably the way it will be
delivered to your door.

Network Terminal Interface (NTI). In order to get ISDN in your house, the phone com-
pany will need to install an NTI unit. This device connects to the pair of wires going back to the
telephone company's central office. A simple NTI costs several hundred dollars and has just a
basic-rate ISDN interface on its side. More-expensive NTIs, costing up to \$1400, also have inter-
faces for traditional analog phones, so you can use your old telephones and household tele-
phone wiring with your new ISDN service.

One of the potential problems with ISDN is operation during power outages and other emer-
gency situations. An analog telephone gets its power from the phone company, but both the NTI
and the ISDN telephone itself require power at the customer's premises in order to work. For that
reason, more-expensive ISDN equipment with backup power supplies is available.

Until now, different companies have implemented parts of the ISDN standard in different, incom-
patible ways. To correct this, the U.S. telecommunications industry came up with National ISDN
1, an agreement signed in 1991 committing the industry to an 18-month timetable to implement
basic ISDN features in ways that would properly interoperate. Many companies expect to have
National ISDN 1-compliant products ready for operation by late summer of 1992.

To set a timetable that means something, Bellcore, the three long-distance companies, and the
seven regional Bell operating companies have designated the third week of November 1992 as
their target date for wide-scale availability of ISDN. The project will start with a 20-city network,
crisscrossing the United States and Canada. By November 1992, telephone customers in any
Trip '92 city should be able to call a customer in any other Trip '92 city, over Sprint, AT&T, or MCI,
and have a fully digital call with a speed of 64Kbits/sec.

The Hayes ISDN eXTender is a box that connects any NeXTcube or NeXTstation to an ISDN
telephone line. Initially, the \$349 box will be certified to operate only in the United States, France,
and Germany; Japanese certification should be available in late 1992. The U.S. version of the
box will also be able to place and receive calls over conventional analog telephone lines.

Inter-state Demo in November

Right now, the U.S. telecommuni-
cations industry is gearing up for
Trip '92, the Transcontinental
ISDN Project.

"We're going to begin with a
20-city network," says Aloia.
"We've invited President Bush to
actuate the "golden splice" — that's
analogous to when the railroads
got standard-gauge track from East
coast to West coast."

With Trip '92, a person with
ISDN service in any one of the 20
cities will be able to call a person
with ISDN in any other of the cities
and be guaranteed a digital path at
64Kbits/sec. The cities are likely to
contain some of NeXT's largest
customers.

"Unfortunately, they will have
to be at relatively well-selected
sites," says Toense. "The problem
is that most of the switches in the
telephone offices are not ISDN-
capable right now."

Getting other cities on-line will
be decided on a case-by-case basis.
Bellcore recently published Special
Report SR-NWT-002102, which
lists every telephone exchange in
the United States and gives a date
when those exchanges will be ready
for ISDN. (The report costs \$102
and can be ordered by calling
908/669-5802.) By the end of
1994, 54 percent of the telephone
lines in the United States will be
capable of handling ISDN.

As far as long-distance inter-
connection goes, MCI plans to be
able to support ISDN connections
in 80 percent of the cities in the
United States by the end of the year.

But for many of us, the future
will arrive in November. ♦

SIMSON L. GARFINKEL
is a senior editor at NeXTWORLD.



IF YOU BUY A NeXT COMPUTER, WHO CARES?

When a computer comes out of its box, most manufacturers consider that the end of their responsibility.

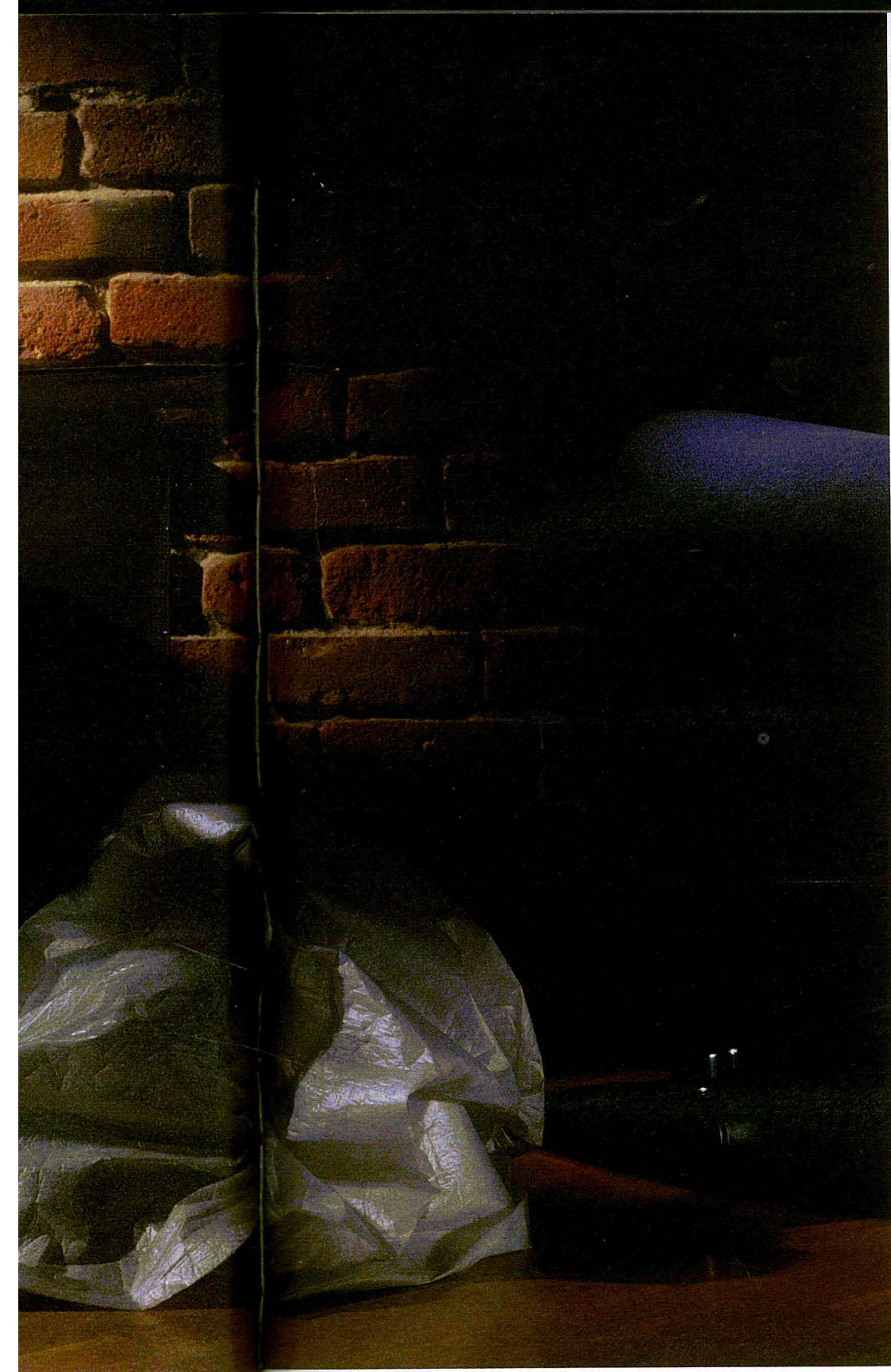
At NeXT™ we take a different view—we

think it's just the beginning.

In other words, when you buy one of our machines, we actually care. So instead of *disappearing* when you get the machine

unpacked, we offer comprehensive service programs in the e

It's called NeXT. security of being a manufacturer. An program to be certain



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u buy one of our
So instead of
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unpacked, we offer you one of the most comprehensive service, support and training programs in the entire workstation industry.

It's called NeXTedge.SM It gives you the security of being able to deal directly with the manufacturer. And it's a flexible enough program to be certain to meet your needs.

For instance, we let you minimize your worries about downtime through *service* direct from NeXT. Our affordable Extended Warranty Contracts give you on-site coverage that extends past the duration of your one-year warranty, for up to three additional years. Options for large and medium-size organizations are also available, and we can create a custom proposal to address any unique needs you may have.

When you need *help*, we can provide it—with our substantial support program. The NeXTedge Technical Support Hotline will give you direct telephone access to our highly knowledgeable Customer Support Engineering team. We also offer a regularly published *support bulletin*, complete with answers to technical questions on a floppy disk.

Our education program will assure that you enjoy the full benefits of NeXT's technology from the very beginning. We offer a complete curriculum—taught at NeXT's headquarters or at any of several locations nationwide. In particular, we offer courses for end users and administrators, as well as a complete Developers' Camp that will help you take full advantage of our unique object-oriented programming capabilities.

Call us today, at 1-800-848-NeXT, for NeXTedge data sheets, course information, and pricing. You'll discover that NeXTedge is quite possibly the most complete program in the industry. In other words, that we care.

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P H O T O T O U R

NeXTWORLD Expo

▼ The capacity crowd streams into Civic Auditorium for Steve Jobs's keynote. By the time Steve comes on, the floor and most of the balcony is filled.

If anyone had dropped a bomb on San Francisco's Civic Auditorium last January 22-24, they could have effectively eliminated NeXT from the computer universe. The full NeXT community was assembled from all over the world for three days of announcements, demonstrations, conferences, briefings, meetings, and plain hard selling. There

was also just enough already lively market.

In fact, judging from the first-ever NeXTWorld Expo, it had been the only way to get the word out from changing the status quo.

Some numbers: 10,000 registrations from 30 states and 33 countries; 10,000 exhibit space; 10,000 registrations for the conference.

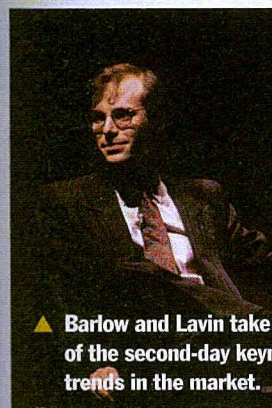
Some other numbers: 10,000 Turbo, Intel i486, and 10,000 NeXT computers.

Optimism was in the air. A photographer was there, this selection of the shoot should bring you, there's always

▼ Steve in his element. The keynote starts with a slide presentation on NeXT financials and marketing and ends with a series of virtuoso technology demos.



▲ Seventy-seven attendees rise in Brooks Hall.



▲ Barlow and Lavin take of the second-day keynote trends in the market.

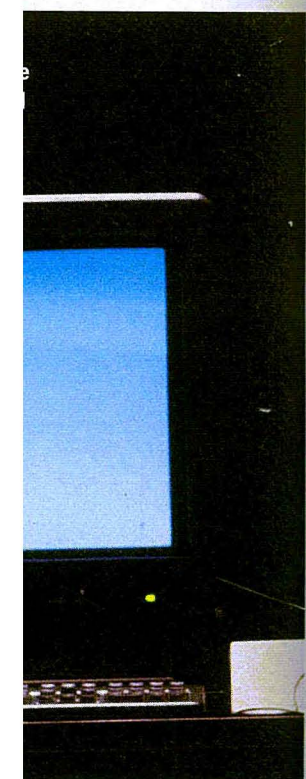
▼ A personal touch during a lull in the otherwise announcement-packed speech. Demonstrating Mail, Steve shows a photo of new son Reed Paul Jobs.

▲ The big news is NeXTstep '486 as Steve meets the press immediately after his two-hour keynote. Later he strolls the show floor.

PHOTOGRAPHS BY JULIE CHASE

U R D Expo

on San Francisco's
22-24, they could
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XTstep '486 as Steve
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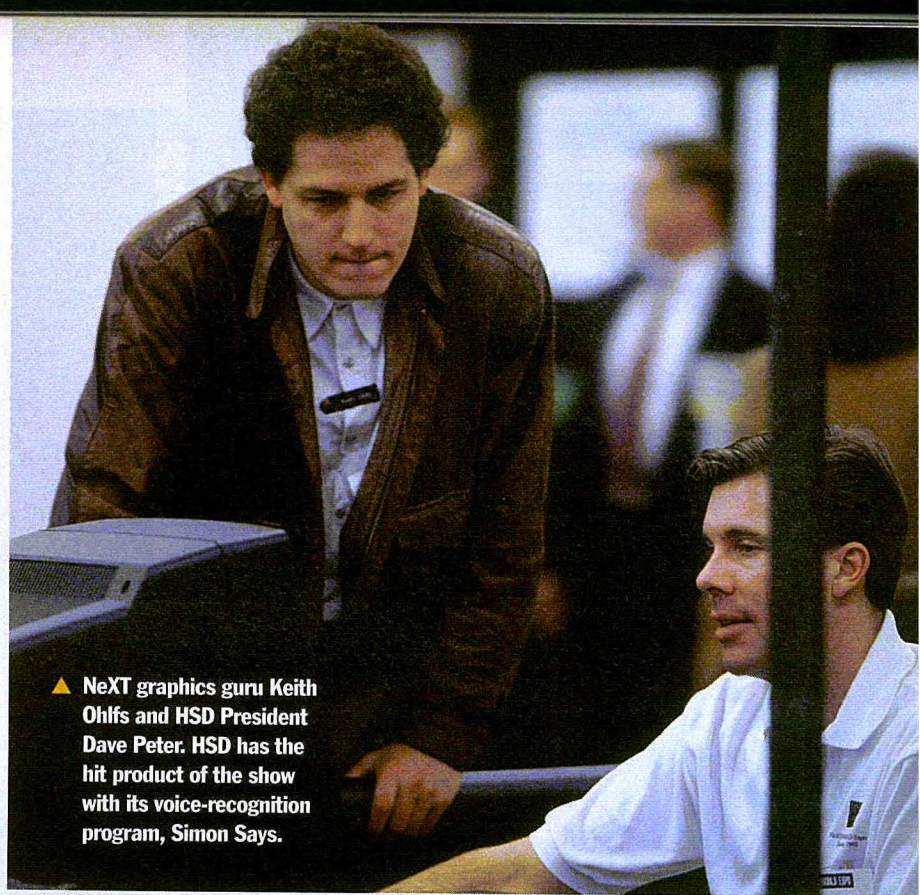
was also just enough nightlife to help lubricate an already lively market.

In fact, judging from the vibrant activity at this first-ever *NeXTWORLD* Expo, a bomb might have been the only way to stop the NeXT phenomenon from changing the future of the computer industry.

Some numbers: 5200 paid attendees from 47 states and 33 countries; 150 booths in 13,000 sq. ft. of exhibit space; 250 user-group volunteers; 595 registrations for the oversubscribed developer conference.

Some other numbers: 33MHz NeXTstation Turbo, Intel i486, and NeXTstep 3.0.

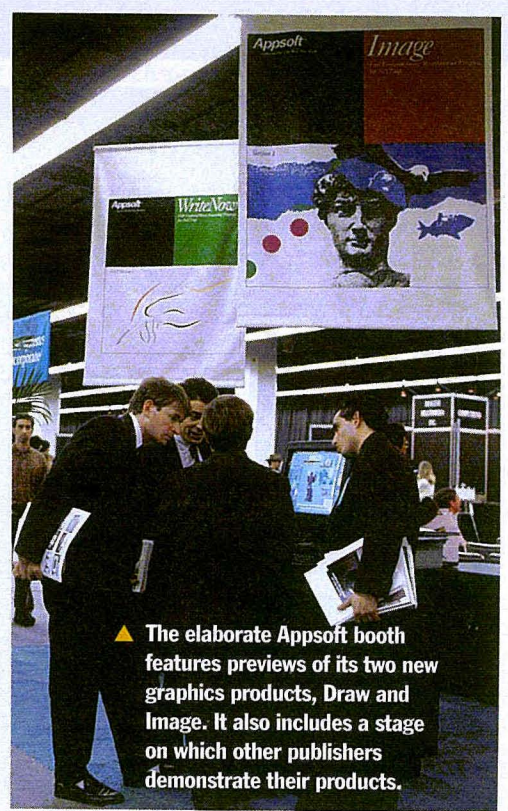
Optimism was in the air and a *NeXTWORLD* photographer was in the aisles. For those who were there, this selection from Julie Chase's three-day shoot should bring back the feeling. For the rest of you, there's always next year.



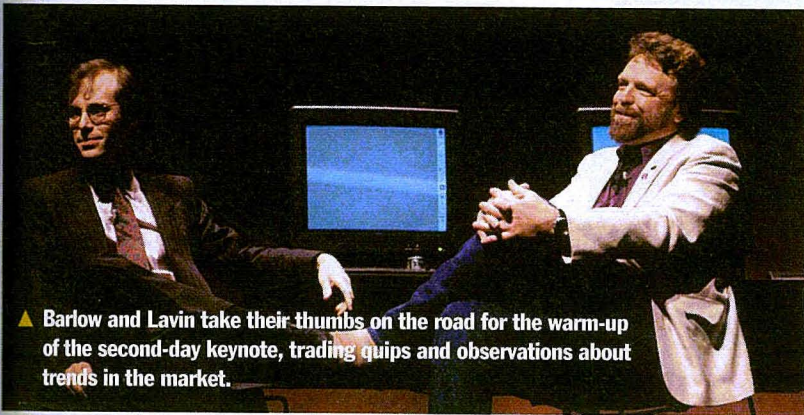
▲ NeXT graphics guru Keith Ohlfs and HSD President Dave Peter. HSD has the hit product of the show with its voice-recognition program, Simon Says.



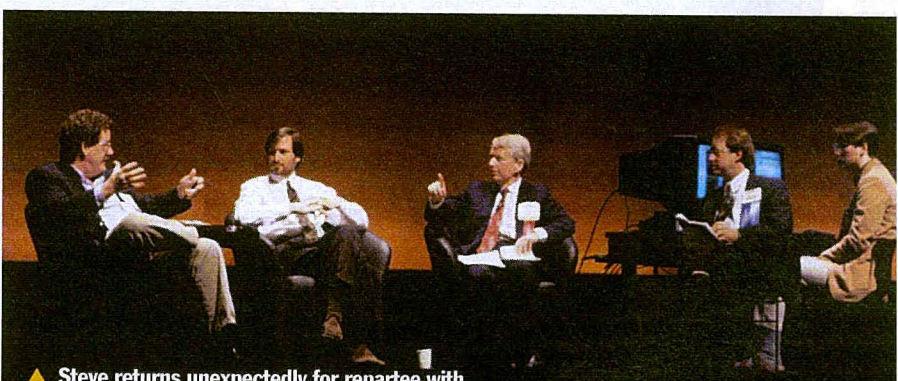
▲ Seventy-seven exhibitors lead the big parade with 5000 attendees right behind. The first day is a mad crush in Brooks Hall as exhibitors rack up sales and leads.



▲ The elaborate Appsoft booth features previews of its two new graphics products, Draw and Image. It also includes a stage on which other publishers demonstrate their products.



▲ Barlow and Lavin take their thumbs on the road for the warm-up of the second-day keynote, trading quips and observations about trends in the market.



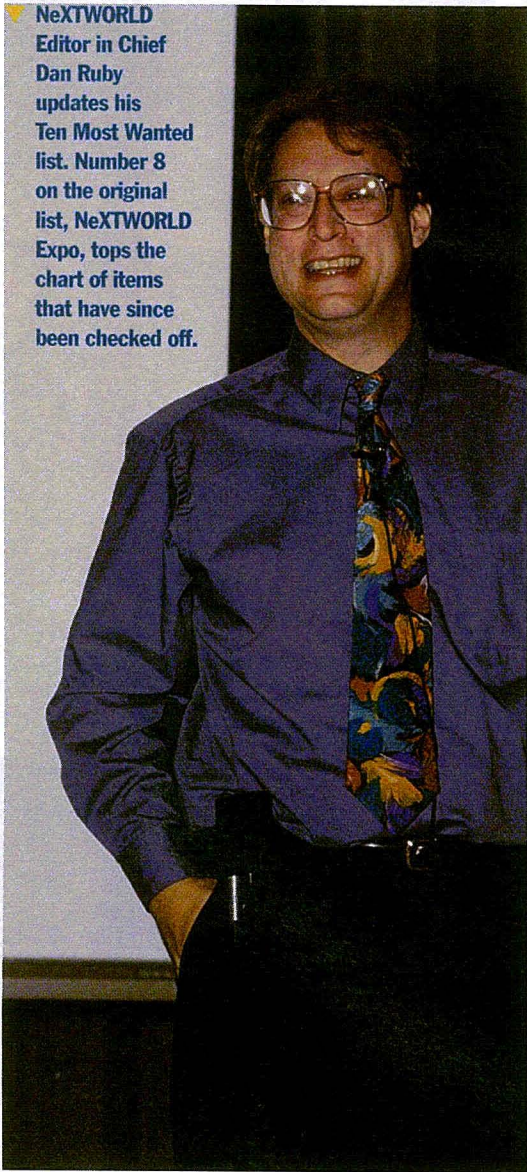
▲ Steve returns unexpectedly for repartee with keynote analysts Stewart Alsop, Jonathan Seybold, and Dan Ruby. Custom apps and the Intel port dominate the discussion.



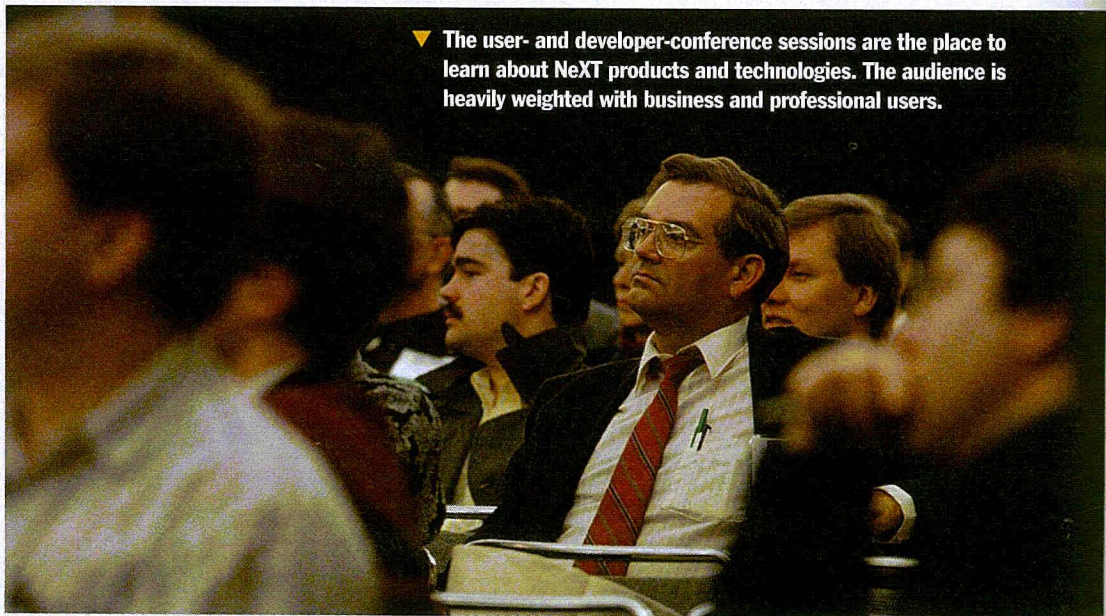
▲ Best-dressed contenders Glenn Reid of RightBrain Software and Karen Armstrong of Microtech International chat at NeXTWORLD's Lt. Sullivan party.



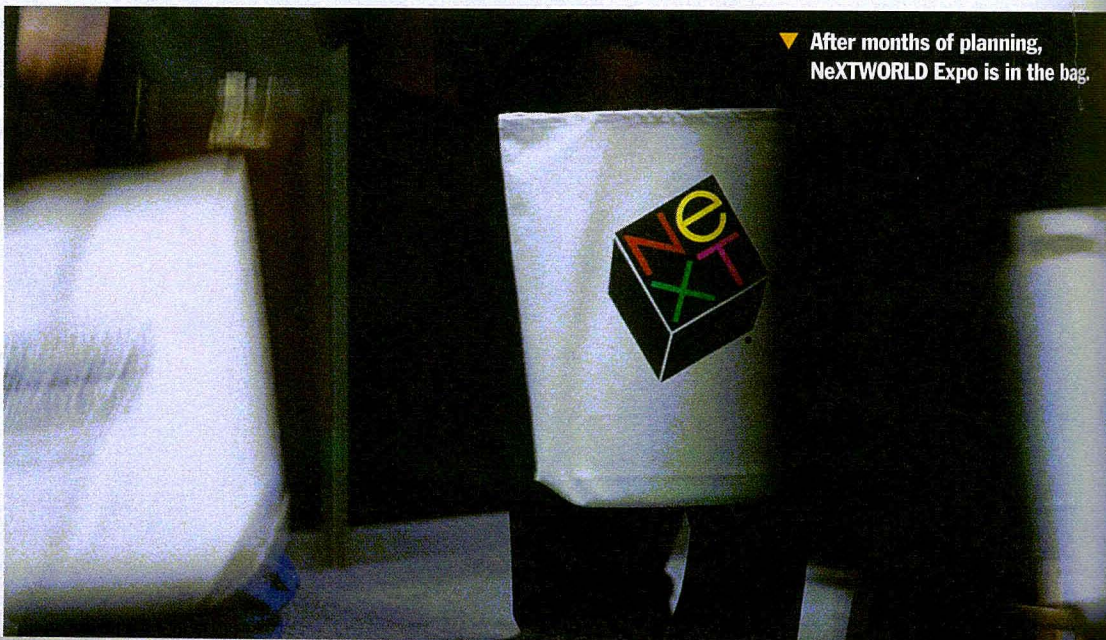
▲ Sergei Morozov of the Moscow NeXT Users Group presents Steve with a gift during the NOIR user-group conference, which draws leaders from 100 international NUGs.



▼ NeXTWORLD Editor in Chief Dan Ruby updates his Ten Most Wanted list. Number 8 on the original list, NeXTWORLD Expo, tops the chart of items that have since been checked off.



▼ The user- and developer-conference sessions are the place to learn about NeXT products and technologies. The audience is heavily weighted with business and professional users.



▼ After months of planning, NeXTWORLD Expo is in the bag.

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*Lighthouse D
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by BEN CALICA

The idea of apply
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thoughts and plans.

Later, other software c
improved on this by associ
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up to meet the demand for
puter-generated slides, and
presentation software is no
mature product category o
computer platforms, espec
Macintosh.

Now, with Concurrent
Lighthouse Design, which
shipping in March, the Ne
form has an outline and p
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platforms. With the suppo
NeXTstep tools and interf
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Harmonic Convergence

Lighthouse Design's Concurrency fills two NeXT niches with style and depth

by BEN CALICA

The idea of applying an outline metaphor to word processing was a breakthrough when Dave Winer and Living Videotext first introduced it on the Apple II nine years ago. The ability to move text blocks around in an outline heirarchy proved to be a powerful tool not just for writers but also for groups of people organizing their thoughts and plans.

Later, other software designers improved on this by associating the outline process with the graphics-communications process of preparing and presenting visual slides of information. New output devices and graphics service bureaus sprang up to meet the demand for computer-generated slides, and desktop-presentation software is now a mature product category on other computer platforms, especially the Macintosh.

Now, with Concurrency from Lighthouse Design, which began shipping in March, the NeXT platform has an outline and presentation tool to rival those on other platforms. With the support of the NeXTstep tools and interface, Concurrency integrates and balances the two functions of the program exceptionally well. While it doesn't break any new conceptual ground over such programs as Aldus Persuasion or Microsoft Power Point, it implements the genre with grace and a sprinkling of innovative features. As such (and despite a list price that we consider to be too

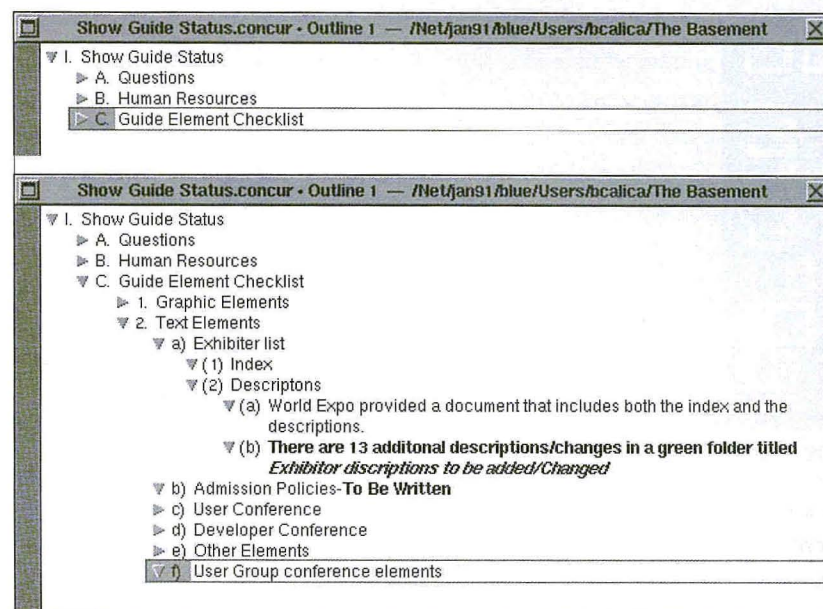
high), Concurrency is likely to become a standard application in the power user's NeXT software toolkit.

A strong outline

Outlining in Concurrency will be familiar to anyone who has used outlining programs on other computers. Text is placed at different heirarchy levels for rapid organization of your thoughts. Then, as you refine the relationships between your topics, they can be moved around the outline and promoted and demoted in relation to the main topics. For display, parent topics can be collapsed to hide the subpoints and expanded to show the full detail. Topics can also be cloned if the user wants to have them repeated several times throughout the document, and any changes on a cloned item will be reflected on other clones. Concurrency also permits focusing and unfocusing on the outline, which allows you to navigate easily into areas of detail.

Elements in the outline are manipulated by clicking and dropping, or with the Tab and Shift-Tab keys pressed together, or with Emacs key controls. Families are collapsed and expanded using key or mouse control. The text in an item can wrap around in a full paragraph, or be cut off to only show the first line.

The program uses two different types of rulers — one for the outline items, and another for the text



The outliner can collapse a great amount of detail to be expanded for later reference.

within those items. Normally peers on the same level share overall font and style characteristics, but those preferences can be overridden by selecting a particular word or phrase and modifying the text directly. The leader-character selection, on the other hand, is universal for a peer group. The choices are Legal (1.1, 2.1, 2.2), Harvard (A, 1, a, b), and Bullet (•). There is no ability to customize the leader characters, but that's rarely needed. The fact that the leader characters are universal for a level is slightly more troubling, but it's easy to work around by using the Views feature.

Concurrency uses the concept of multiple views to let users change the way their information is displayed to different audiences. Each view is connected to all others. Cosmetic things, such as the font and formatting, and even what families are expanded or collapsed,

are kept local to each view. But any changes to the substance of the text, including an item's order or position, are instantly mirrored in all views. The views are used both to customize outlines for a particular audience and to make slide shows. Views are managed from Concurrency's View Browser.

The program uses the standard NeXT Spelling and Find interfaces throughout both parts of the program. But another standard NeXT implementation causes a little trouble: Concurrency obeys the paste-board rules and allows you to copy a desired section of the outline for pasting into any application that can read standard RTE. Some applications like Mail have no problem correctly interpreting the formatting and font information, but neither WriteNow nor WordPerfect — programs NeXT users are likely to use in conjunction with Concurrency — can make the same claim. WriteNow will keep the outline's formatting but ignores all the font and font style information. WordPerfect keeps the font information but strips out the formatting. Lighthouse plans to include both import and export modules in the future.

NeXT slide, please

Creating a slide show from the View Browser automatically creates

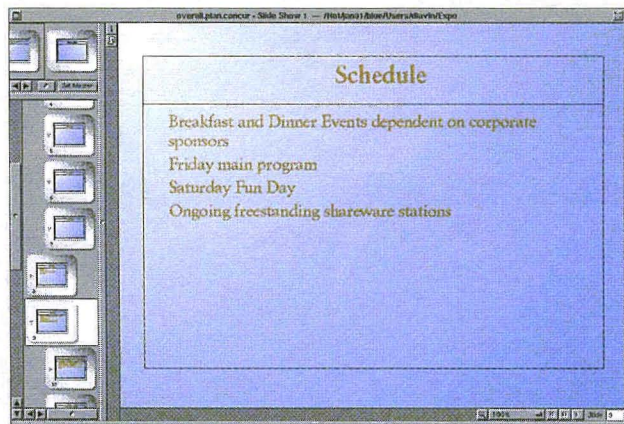
Concurrency 1.0

beta

Designed for both idea processing and desktop presentations, Concurrency is an excellent combination of an outliner and a slide-based presentation package. Both sides are clean, easy to use, and fully functional. It's an exceptionally well-developed product for an initial release.

\$995

Lighthouse Design, 6516 Western Ave., Chevy Chase, MD 20815.
800/366-2279, 301/913-2806 fax.



The slides can be moved around, just like the outlines.

a sequence of slides from the current outline. The slide view obeys the same rules as the outline views—they can be rearranged, expanded, and collapsed just like the outline. Any cosmetic changes stay local, and any substantial changes, such as rearranging the order or changing the text, will be reflected throughout the document.

The tools for embellishing a slide are powerful and easy to use. In addition to dragging standard NeXT document types such as EPS files right onto the slide, Concurrence borrows from the graphics palette in Diagram, Lighthouse Design's popular graphics program. All the basic shapes can be pulled from the palette and dropped onto a slide. Those objects can have their fill pattern, size, and shadow manipulated from the object inspector. A wide variety of gradient graphic fills can be used either on a particular graphic element or the whole slide. The graphic palette can also be used to create freestanding text for a slide; this is the only text that can be created or changed locally to a slide and not be reflected through the entire document. As you would expect, Concurrence supports the full range of colors, with stunning results in the hands of a graphic designer.

Mind your masters

To enable common graphic elements and text styles to be shared among multiple slides, Concurrence

utilizes a master slide that automatically updates related presentation slides. This is standard in these types of packages and is both highly useful and occasionally annoying. Usually, you'll want to have consistency

in the style of your slides, but sometimes you want to break from the norm. Concurrence solves this problem in two ways: Either you override the master items on a slide-by-slide basis, or you create multiple master slides. The additional master slides can be connected to any set of slides selected. This option provides tremendous flexibility.

Other options that can be set either at the slide or master level include transition effects, sound, and auto-cycle times. The transition effects are how one slide graphically shifts into the next, and include choices for Dissolve, Iris, Scroll, Slide, and Wipe. The Inspector previews each of these effects when you set them. The user can also set a sound to be automatically



To add punch to a slide show, add special transitions or sounds to each new slide.

played when a slide is shown. There are no options to control when it will play other than on the slide's first appearance. Of course if the user wanted to cue a sound, the easy workaround would be to create a duplicate of the slide and have the sound attached to it—then the sound would accompany an invisible change. Finally, the user can, in automatic mode, set how much time a slide will be visible.

It's show time!

When it is time to give a presentation, there are several options. Printing to paper or overhead transparency is the simplest; most good stationery stores stock overhead transparency paper suitable for xerography. With NeXT's new color printer, slightly different overhead transparency sheets are needed, but the results are quite nice. The next option is 35mm slides. Lighthouse lists several service bureaus that are savvy about Concurrence and who are either on the net, can be directly connected by modem, or will take NeXT floppies. The price for this service is anywhere from \$10 to \$25 a slide, depending on resolution and urgency. It can also output to a local slide recorder, such as the Rio Film Recorder offered by Houston-based Talus Corporation.

The final method of presentation is directly on the screen. The slide show can be set to take over the whole NeXT screen, which is large enough when presenting to a small group. (Of course, projection options are available for larger gatherings). Concurrence has several options for the slide show. They can be set up in kiosk-like automatic loops, with each slide staying on screen for a length of time that you predetermine. This can be interrupted only by hitting the Esc key. Or the user can control the presentation from the cursor keys or mouse, with the mouse

working like a forward-only remote control, each click advancing one frame. The cursor keys, on the other hand, have the ability to go back and forth.

The final option that the Lighthouse people have added to the product is Prepare for Mailing. Knowing that it is quite likely that Concurrence presentations are going to be sent between co-workers or distributed to customers over networks, the Prepare for Mailing option gathers all the files that have been linked into the presentation and makes the document self-sufficient. Lighthouse has talked about providing a means for people who don't own Concurrence to be able to view the documents directly, but that's still in the future.

The price of quality

All of Concurrence's depth and style comes at considerable price: \$995 list, or probably about \$800 through a mail-order house. Aware as we are of the economics of the NeXT software market and the willingness of many workstation buyers to pay handsomely for great software, we still think the price is too steep. Fortunately, the company of recent college graduates has pledged to have very aggressive academic pricing. We'd like to see all NeXT users be able to get their hands on Concurrence.

It's that good. Either the outliner or presentation package would have been a valuable addition to the NeXT software library. Packaged together in harmony with the NeXTstep environment, Concurrence is a compelling piece of software that NeXT users won't want to live without. ♦

BEN CALICA, founding editor of NewMedia magazine, is currently a free-lance writer based in San Francisco. He was previously a NeXT advocate.

Talk is

Simon Says by recognition

by LEE SHERMA

Visionaries have looked forward day when we engage in eloquent discourse with our computer. Researchers in the field of language recognition, how know better: Figuring out person is saying is hard work. A computer, the task is nearly impossible.

But faster computers are rapidly making things that "nearly impossible" a commonplace today. Already a variety of NeXT applications recognize the human voice to the Visus SpeechKit developed by Carnegie Mellon University. In fact, the SpeechKit requires developers link the kit into application and follow a set of application programming in order to integrate speech recognition into their software. It work with shrinkwrapped shelf apps.

Now HSD Microcomputer U.S. has brought us Simon Says.

Simon Says

Software that brings affordable recognition to the NeXT Mac. Speaker-dependent, language-independent system can be trained to any NeXT application. You can hide, and quit applications, perform matting operations, send mail, voice macros. Similar-sounding commands and background noise confusion. Voice commands to menu items that have keyboard natives.

\$295

HSD Microcomputer U.S., 1111 Ave., Ste. C, Mountain View, CA 94035. 800/828-5522.

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Talk is cheap

Simon Says brings affordable voice recognition to the NeXT

by LEE SHERMAN

Visionaries have long looked forward to the day when we would engage in eloquent discourse with our computers. Researchers in the field of natural-language recognition, however, know better: Figuring out what a person is saying is hard work; for a computer, the task is nearly impossible.

But faster computers are rapidly making things that were "nearly impossible" a decade ago commonplace today. Already a variety of NeXT applications can recognize the human voice, thanks to the Visus SpeechKit developed at Carnegie Mellon University. But, alas, the SpeechKit requires that developers link the kit into their application and follow a special application programming interface in order to integrate speech recognition into their software. It won't work with shrinkwrapped, off-the-shelf apps.

Now HSD Microcomputer U.S. has brought us Simon Says, a

program that offers speech recognition for the masses. Although it is speaker dependent, meaning that each user must train Simon to recognize his or her own words, Simon works with any NeXTstep application program — as long as the only thing you want to do is click menu options, type text, and put recorded strings onto the pasteboard. Simon won't take dictation, and it won't fetch last quarter's sales results unless you specifically say where they are. But there are many tasks at which it excels.

Sound system

Simon Says ships with predefined word lists for the bundled NeXT applications (like Mail and Digital Webster's) as well as for Appsoft's WriteNow. The first time you launch the program, Simon starts training. For each command, Simon flashes the word on the screen and you repeat it three times. Be careful to speak the word the same way each time, since Simon is learning to recognize the actual sound of your voice rather than the words you speak. But don't fret: If you are inconsistent in your pronunciation, Simon will ask you to repeat yourself.

Simon improves its accuracy by grouping the commands it recognizes by application. Therefore, it has a relatively short list of choices to make for any word you say; this shortens the number of choices for each word. It takes only a few minutes to train the word list for a given application, but you'll probably want to go back and retrain certain words for improved accu-

racy as you get the hang of the program. Training takes place in a special window; a browser along the top of the window shows you which commands have been assigned to each application. When you're finished training you'll be able to execute any menu item that has a keyboard equivalent simply by speaking it.

Simon sits in the Application Dock, where he listens attentively until he hears a sound that he recognizes as a word. After comparing it to the list, he executes the closest-sounding command. Simon will smile, frown, or look puzzled depending on how well he recognizes your words. You can temporarily suspend Simon Says by telling Simon to cover his ears. This is useful if you want to carry on a conversation with someone who has entered your office without confusing the program.

Simon Says will only respond to the voice of the person who trained it. This is important in

crowded offices, where several co-workers could be talking to their machines at the same time. In especially noisy offices, you'll want to use a headset.

On the other hand, Simon's speaker-dependent recognition is language independent, meaning it is not limited to recognizing only English speech. This is a big plus, considering NeXT's emerging world market.

In addition to menu commands, Simon Says can type predefined strings on your keyboard (voice macros!), run UNIX shell scripts, switch applications, and more — all chosen through a series of intuitive inspectors. Simon can even be programmed to play sounds in response to voice commands: Now when you curse at your computer, it can curse back!

The wow factor

Is Simon Says merely the latest techno-toy or will it really increase your productivity? There's no deny-

Since NeXTWORLD Expo, it's no whisper anymore:

Neat!



PhrasePlayer™ is a voice-activated dictation machine that plays your voice mail at varying speeds while you transcribe it in your word processor. It is the ideal extension to your NeXT network.

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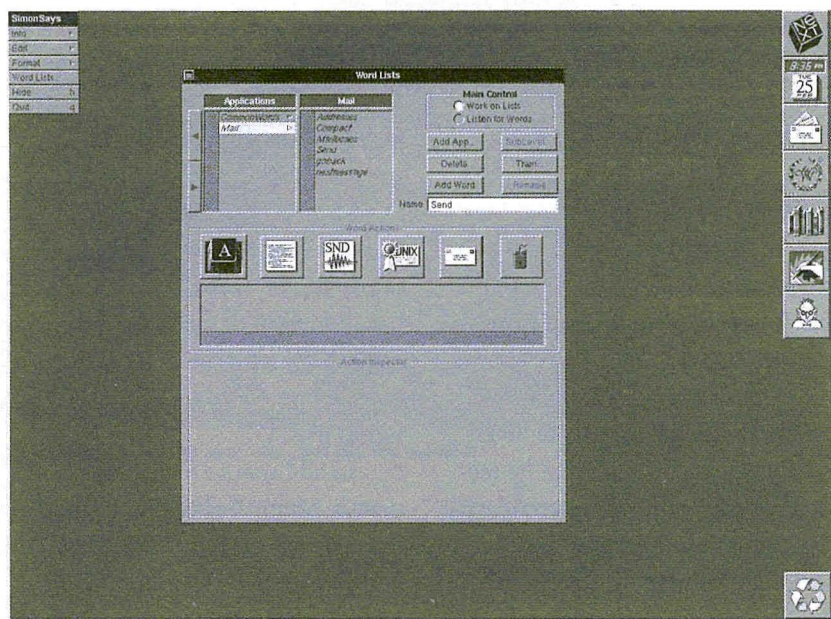
Simon Says



Software that brings affordable voice recognition to the NeXT machine. The speaker-dependent, language-independent system can be trained to work with any NeXT application. You can launch, hide, and quit applications, perform formatting operations, send mail, and create voice macros. Similar-sounding commands and background noise can cause confusion. Voice commands are limited to menu items that have keyboard alternatives.

\$295

HSD Microcomputer U.S., 1350 Pear Ave., Ste. C, Mountain View, CA 94043. 800/828-5522.



Simon Says can understand different sets of commands for each application.

ing the thrill you'll get the first time the computer responds to your voice. For showing off to your friends, the program has no equal.

After a few days, when the novelty wears off, you'll begin to realize how useful this program really is. Most studies cite at least a 50 percent increase in productivity when voice is used along with other types of input, and my experience confirmed this.

Talking to my computer quickly became second nature. In many ways, Simon reminded me of the first time I encountered that strange creature called a mouse. Although using it was awkward at first, the mouse soon became a natural extension of my arm.

Using Simon Says really did speed up my work. For example, I saved my document more often because all I had to do was say the word "save." Simon Says seems particularly well-suited to graphics applications like Adobe Illustrator and Create, in which the creative flow is sometimes destroyed by the need to take your hands off the mouse to choose tools or menu items. Using Simon Says, you can keep your hand in the drawing area. Simon is also a time-saver when you need to choose a command that is buried several levels deep in a hierarchical menu.

NeXT's own applications seem made for voice recognition. In Mail, for example, you can record a voice-mail message and send it on its way, all without using your hands. Simon Says even helps to minimize the negative aspects of the system: A large monitor is great, but you can quickly tire of moving the mouse vast distances across the screen. With Simon Says, you don't have to.

I had the most success with Simon in the Workspace, where Simon Says can be used to launch applications, empty the Recycler, or bring up the Processes panel. Simon Says can even serve as a Dock extender, since there's no longer any need to store your applications in the Dock to access them quickly.

The NeXT finds its voice

The NeXT computer wasn't designed for voice control, but it is uniquely well suited to it. The consistency of NeXTstep's command structure allowed the developers of Simon Says to concentrate on recognizing a core set of commands, increasing general accuracy. But the biggest gain is in the hardware. The closest competitor to Simon Says, Voice Navigator II on the Macintosh, requires a hardware interface containing a DSP and a microphone in addition to its software,

boosting the cost of simple voice recognition to well over \$500.

Surprisingly, Simon Says does not use the DSP chip found in every NeXT computer and is well-suited for the high-speed computations necessary for speech-recognition. Instead, Simon does all his work on the '040, which has proven to be fast enough for real-time recognition without degrading system performance. This frees the DSP for other tasks.

Simon Says is so well integrated with the rest of NeXTstep that it seems a natural extension of the operating system. For example, careful attention was paid to multitasking: The appropriate word list is automatically activated as you switch between applications.

Word lists can be shared among users, although each user will have to train Simon to recognize his or her voice. Nevertheless, this feature can save time if you've customized the list extensively.

Listen up

Any NeXT application can be trained to work with Simon Says; the program simply looks in the .nib file for those items that have keyboard equivalents. Unfortunately, there's no way to assign voice commands to the other menu items. There's also no way to control buttons in panels or describe mouse movements and clicks. Hopefully, HSD will address these shortcomings in a future version of the program.

Though extremely accurate, Simon Says isn't perfect. The first time the computer pops up a panel that you didn't ask for or refuses to respond to your insistent demands, you'll be tempted to give up the idea entirely. Nevertheless, these occasional glitches aren't enough to diminish the wonder of this program.

In the prerelease version looked at for this review, the program often had difficulty with the noise

generated from my typing in an otherwise quiet environment. Oddly enough, it did a much better job of filtering out other kinds of background noise, even the loud music that permeates my workspace. HSD is aware of the problem and assures us this will be fixed by the release date.

While the built-in microphone on the front of the MegaPixel Display is adequate for occasional use in noisy environments and full-time use in more quiet ones, many users will want to consider purchasing a higher-quality mike, preferably a unidirectional headset.

Since Simon Says is intended to be used all the time, users may also run into conflicts with programs that run in the background (such as the popular screen saver BackSpace). These programs will slow to a crawl while Simon is "thinking."

Since a prerelease version of Simon Says was used for this review, we are assigning it the maximum prerelease rating of four cubes. We expect to be able to upgrade this to five if the shipping product with completed documentation, due to ship before you read this, matches the quality of the beta.

NeXT folklore has it that Steve Jobs wanted to include the ability to respond to voice commands in the original Cube, but it proved too difficult to implement in time for the machine's unveiling. As with the fabled DSP modem, it took an innovative third-party developer to finally make his vision a reality. ♦

LEE SHERMAN is a writer and NeXT developer specializing in music and multimedia.

Boots Suspe

Tired of mouse utilities exten

by DANIEL MIL AND SETH T. R

When you w to NeXT, t Workspace bright, glea

But as your files accumula you discovered the limitati the Application Dock and the joy may have given wa tration. If so, you have a v world of Workspace exten explore. In this review, we six NeXTstep utilities that and embellish the Dock or new ways to organize you

Engage

At first glance, Atherton Software Works's Engage is only a Dock extender. It provides a shortcut to launching more applications than those that fit or NeXT Dock.

Engage, however, doe than just shorten the path cations. It implements Ne drag-and-drop design phil with grace, allowing you t documents and folders wi cations on an alternative c lets you turn a dock into a of projects, with no distin among folders, applicatio documents.

Quite literally, Engag the Dock and the Shelf in dimension. You add appli documents, or folders to t



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ERMAN is a writer and looper specializing in multimedia.

Boots and Suspenders

Tired of mousing around? These six utilities extend the Workspace

by DANIEL MILES KEHOE AND SETH T. ROSS

When you were new to NeXT, the NeXT Workspace was a bright, gleaming joy. But as your files accumulated and you discovered the limitations of the Application Dock and the Shelf, the joy may have given way to frustration. If so, you have a whole new world of Workspace extenders to explore. In this review, we look at six NeXTstep utilities that extend and embellish the Dock or provide new ways to organize your files.

Engage

At first glance, Atherton Software Works's Engage is only a Dock extender. It provides a shortcut to launching more applica-



Engage requires the smallest screen space of any Dock extender.

tions than those that fit on the NeXT Dock. Engage, however, does more than just shorten the path to applications. It implements NeXT's drag-and-drop design philosophy with grace, allowing you to mix documents and folders with applications on an alternative dock. It lets you turn a dock into a stack of projects, with no distinctions among folders, applications, and documents.

Quite literally, Engage extends the Dock and the Shelf in another dimension. You add applications, documents, or folders to the Engage

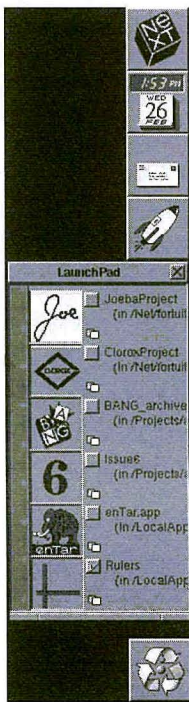
dock by dragging and dropping them on the Engage icon, known as the Tile. Engage allows you to stack icons horizontally, vertically, or in free-form fashion. You can set up different docks in a series of levels that hide one behind another. You can move to a different level by clicking the arrows on the Engage Tile; each level can be named (for example, Apps, Utilities, Projects, Images, Boilerplate). By clicking a tiny circle in the Engage icon, you can flip the line of icons off the screen and out of view, ready to return when you need them. When you launch an app, the application icon does not appear at the bottom of the screen but remains in the Engage grid.

Engage offers other bonuses. There's a screen saver that accepts the popular BackSpace modules. Engage can also function as a portfolio of often-used TIFF or EPS images, displaying miniature versions of images in its icons.

Learning to use Engage effectively takes some time. Once in place, however, it allows you to bypass the File Viewer in favor of zippy access to hot projects. If you are the type who arranges papers in neat piles on your desk, then you will love this program.

LaunchPad

The principle behind LaunchPad, from RightBrain Software, is simple: It enables users to rapidly launch groups of applications, fold-



LaunchPad extends the Dock, mixing applications, folders, and files at will.

ers, and files. The main organizational metaphor is the pad, a resizable gray window that acts somewhat like a second Application Dock. As with Engage, users can drag and drop File Viewer items into the pad

for easy access.

The linchpin of LaunchPad is the Launch command. A simple "Command-I" will open either all the items in the pad or only those items marked in a small check box near each icon. This feature can drastically reduce set-up time. Rather than mouse around in the



QuickStart economizes on screen space by stacking applications in a scrollable list.

File Viewer, you can open an entire project with a single keystroke.


Working with LaunchPad is a no-brainer. Our only complaint is the amount of screen real estate it hogs. Fortunately, triple clicking or double clicking while holding down an Alternate key an item hides LaunchPad entirely.

One thing to consider before blasting off with LaunchPad: A NeXT configured with a mere 8MB of RAM will crawl to a halt if you launch several apps at once.

LaunchPad is just one of a suite of utility apps currently offered by RightBrain Software that includes Portfolio (see below), Rulers, and LockScreen. Like its sibling apps,

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Cool!



Thanks to incremental strategies, avoid copying your whole system every day. And restore any lost file with a real file browser. With **BackupMaster™** for the NeXT, your data is safe.

Sometimes, one word is enough.

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Circle 47 on reader service card

LaunchPad is well implemented and easy to use. For the power user who likes to set up quickly, it could be a valuable tool. For the ordinary user at the console of a memory-starved NeXT, it could be a potato in the tail pipe.

QuickStart

QuickStart from Aurora Software is a simple Dock extender. It contains the same core functionality as Engage and LaunchPad. For exam-

ple, drag every application in /LocalApps, /NextApps, and your home /Apps directory to QuickStart's simple little panel and be assured of retrieving any application without navigating the File Viewer. Unlike LaunchPad, QuickStart's list contains no icons, greatly conserving screen space.

Click any application on the QuickStart list and it will launch. Or use QuickStart's Inspector panel to set your most-used applications

to launch when QuickStart is started; then drop QuickStart in the NeXT Dock and set it to automatically launch when you log in. You'll have a full set of your favorite applications ready to roll.

Unlike Engage, application icons are not absorbed by QuickStart; they still show up at the bottom of the screen. The real benefit of QuickStart is as a shortcut to your applications. Its only real drawback is its inelegant icon.

Portfolio

RightBrain's Portfolio is a simple tool that solves the problem of readily identifying and accessing image files in the NeXT Workspace. By dragging and dropping image icons from the Workspace, the user can collect a portfolio of 1.25-inch-by-1.25-inch thumbnail images that vertically stack in a Dock-like window.

Graphic artists, designers, and other users who frequently need to



Portfolio stashes TIFF files in a scrollable window for easy

view and inc images into will be jazze app. Portfoli nomical disp images is bo rate and har can set up di portfolios, e assembled fc ent project.

We used to collect im ing a book c and then to load the imag FrameMaker file. Loading into Portfolio was a no-br we found it time consumi order the images we had c It took some time to get u constantly hiding the appl Portfolio is in your face u tell it go away.

Like its sibling app, R Portfolio will find a niche artists. Those who don't e breathe image files can pr without it. The Workspac ager offers an Inspector pa has an option for viewing

Album

Album is another image-o tion utility like Portfolio, a separately or as one part o collection, ToolDisk, from Two Software-Entwicklung For this review, we looked the Album application.

Album addresses the s problem as Portfolio: how the right image in the comj the NeXT file system. You image files by dragging and ping them into an album; f album you can drop the in into a document. The mair ence is that Album allows ; organize sound and RTF fi addition to EPS and TIFF f

Like a distant relative NeXT File Viewer, an Albu

Album	◆◆	Album allows you to collect images, sounds, and text files (but not applications) for quick access, but its functionality is superfluous and its interface is an encumbrance. May be better bought as a part of the ToolKit bundle.	\$59	Forty-Two Software-Entwicklung GmbH, Jessenstrasse 4, W-2000 Hamburg 50, Germany. 49/40/38-19-24, 49/40/380-0443 fax; e-mail: info@forty-2.de.
Portfolio	◆◆◆	This simple utility lets you stash EPS or TIFF files in a scrolling window. It may be handy for the busiest graphic artist, but at the price, it's an extravagance for the ordinary user.	\$99	RightBrain Software, 132 Hamilton Ave., Palo Alto, CA 94301. 415/326-2974, 800/472-7246, 415/326-2977 fax; e-mail: info@rightbrain.com.
Engage	◆◆◆◆	A radical app in a trivial category. It lets you organize files, folders, and applications in the smallest screen space possible. Not recommended for easily confused novices.	\$99	Atherton Software Works, 77 Marsh Rd., Atherton, CA 94025. 415/321-3720, 415/321-3650 fax.
LaunchPad	◆◆	This single-purpose utility puts commonly used files, folders, and applications a quick keystroke away. Its window consumes substantial screen real estate.	\$99	RightBrain Software, 132 Hamilton Ave., Palo Alto, CA 94301. 415/326-2974, 800/472-7246, 415/326-2977 fax; e-mail: info@rightbrain.com.
QuickStart	◆◆◆	Straightforward functionality at a bargain price recommends this utility.	\$19.95	Aurora Software, 16 N. Allen St., Madison, WI 53705-3924. 608/231-3679; e-mail: info%auroras.uucp@uunet.uu.net.
MetroTools	◆◆◆	MetroTools packages a set of six utilities of varying usefulness. It's not worth the price of admission for Application Launcher alone, though the grab-bag may have value for some users.	\$129	Metrosoft, 712 Vanitie Ct., San Diego, CA 92109. 619/597-7518, 800/851-8665, 619/488-3045 fax.

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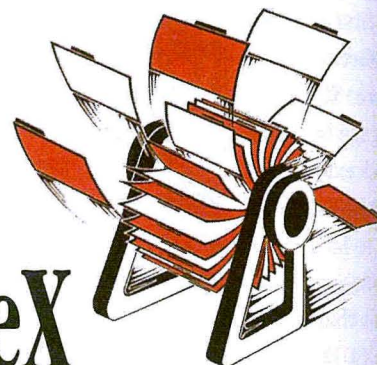
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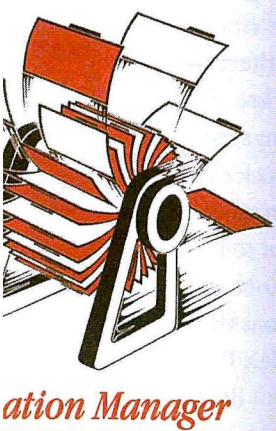
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REVIEWS

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ct a portfolio of 1.25-inch-
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icking GmbH, Jessenstrasse 4,
rmany. 49/40/38-19-24,
il: info@forty-2.de.
Hamilton Ave.,
5/326-2974, 800/472-7246,
: info@rightbrain.com.
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Portfolio stashes EPS or TIFF files in a scrolling window for easy retrieval.

view and incorporate
images into their files
will be jazzed by this
app. Portfolio's eco-
nomical display of
images is both accu-
rate and handy. Users
can set up different
portfolios, each
assembled for a differ-
ent project.
We used Portfolio
to collect images relat-
ing a book chapter
and then to load the images into a
FrameMaker file. Loading images
into Portfolio was a no-brainer, but
we found it time consuming to
order the images we had collected.
It took some time to get used to
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ence is that Album allows you to
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addition to EPS and TIFF files.

Like a distant relative of the
NeXT File Viewer, an Album win-



Album's interface is cluttered, but it offers quick access to favorite images, sounds, and documents.

dow has three sections: an image
display area at the bottom, an
iconic overview in the middle, and
information about selected files
with an icon well on top. You can
browse through your images by
clicking on the icons or by using a
pager at the top of the window.

Unlike Portfolio, Album
accepts groups of files at a time.
Musicians will enjoy collecting and
grouping favorite sound files:
Album sports a small sound-check
panel that lets you play the music.

Album goes further than Port-
folio, but its added functionality
comes at a price – Album can be an
interface monster. The icon well is a
relic of NeXTstep 1.0; a more up-
to-date interface convention would
allow you to drag and drop from
the overview field as well. Also, the
listing mode is slow, and it's hard to
rearrange your entries.

Album replaces one complex
interface (Workspace Manager)
with another. The Workspace's
Attributes Inspector performs some
of the same functions for free,
putting Album in a class of super-
fluous utilities.

MetroTools

MetroTools from Metrosoft is a
grab-bag utility collection that
includes a Dock extender, archiver,
screen saver, file locator, and two
Macintosh migration tools that
convert Mac fonts and sound files
to NeXT formats. We reviewed
only the Dock extender.

This collection of modules

sports an intriguing interface that
has the same "look and feel" as
NeXT's Preferences application.
We sparked up the Application
Launcher in the beta version of
MetroTools and set it up alongside
its glossy competitors. Unfortu-
nately, there's not much basis for
comparison – yet. Like QuickStart,
the Application Launcher allows
you to drag and drop commonly
used applications into an icon well.
Once configured, the Launcher pro-
vides a simple menu that contains
your apps. This vanilla approach
works, but it lacks the multiple-
launch power of LaunchPad or the
mix-and-match utility of Engage.
While MetroTools's other modules
are useful, we can't recommend
MetroTools solely on the basis of
its Application Launcher.

Do you need it?

Does the NeXT Workspace really
need embellishment? Before you
plunk down your charge card, ask
yourself if you need any of these




The MetroTools Application Launcher tucks in close to the Dock with a pull-down menu.

tools. If you're
new to NeXT,
there's no rea-
son to confuse
yourself with Dock extenders or
Workspace enhancers. But if
you've grown tired of hunting and
gathering through the file system,
go ahead and reorganize your
apps and files with a Dock exten-
der like Engage or an art keeper
like Portfolio. ♦

DANIEL KEHOE and
SETH T. ROSS are contribut-
ing editors for NeXTWORLD.

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Screen Savers

Barlow: Among the items I've found lacking from the NeXT software suite is something I felt a little silly about wanting so badly: a screen saver. It wasn't that I thought NeXT's system of twilighting the monitor was improperly protecting my pixels from the heartbreak of burn-in – I think computers need such goofiness to prevent being taken too seriously.

Suddenly, my wish has been granted in spades. In the course of the last several months, three different methods for making my computer dream have suddenly appeared.

Besides displaying animations, each program also provides password-protected means of locking one's screen from the prying eyes of co-workers. This makes it possible to keep your endeavors secret without logging out.

Two of these are commercial products, LockScreen from RightBrain Software and PixelSaver from Pixelated Technologies. The third, BackSpace, a shareware program developed by NeXT employee Samuel Streeper, broke the ground for the category, having already spawned a slew of animated plug-ins or views. BackSpace is currently in limbo after NeXT – protecting the turf for commercial developers – instructed Streeper to remove BackSpace from the Internet archives.

LockScreen is the least whimsical of the bunch. Its icon is a bulldog and if it could talk it would say something like, "Keep your eyes off my screen, Buster!" One especially paranoid feature is its ability to log nefarious efforts to gain unauthorized access, including every password the miscreant tried. On the other hand, LockScreen contains my favorite of all the views I've seen: a screen saver that flings onto the screen random words from one of the NeXT's dictionaries. I use it whenever I need literary inspiration through free association. Unfortunately, LockScreen has no provision for plug-in modules.

PixelSaver admits a variety of plug-ins, including BackSpace views, PostScript files, and Scene movies such as those bundled with the NeXT. It can also run shell scripts and executables, all with full sound, color, and network capabilities. It can even run a screen saver over the login window (the others can't). Its screen locker is the friendliest of the three, enabling the unauthorized to receive and leave messages.

Still, I suppose my favorite remains BackSpace, and not merely because it's now a rogue program. I like its ability to run any of its views as screen backdrops – hence the name. I like its open architecture, which will continue to inspire a great froth of goofy creativity.

My thumb is up for all of them, but it's especially upright for BackSpace. 🍷

Lavin: You're right, John, that NeXT's auto-dim feature has proven sufficient to prevent burn-in, but with the variety of screen lockers and screen savers now available there's no reason to rely on NeXT's dimmer.

Like you, I'm taken with the BackSpace views, and with the variety of options for PixelSaver. LockScreen puts its emphasis on security, which

should not be overlooked as a function of these products. Besides, a somewhat-chagrined Glenn Reid will soon catch up in visual interest, I suspect.

You know, this is terrific – three vendors in spirited competition. How do they compete? By supporting each other's formats. They all get a hearty thumbs up for their incredible spirit and good products. 🍷

Dock Extenders

Lavin: If the average PC user uses only two or three applications on a regular basis and the average Mac (or Windows) user eight or nine, then I predict the average NeXT user will have 20 apps in regular use within a few years. Some of these 20 apps will be big-ticket productivity programs; others will be small software utilities that allow users to customize their work environment to behave exactly as they like.

To me, utilities are a key indicator of the health of a platform. Their appearance is a sign that the market has started to hit critical mass. That has certainly begun to happen on the NeXT, most recently in a rush of extenders for the Application Dock and File Viewer. First we had RightBrain Software spinning out Portfolio, a Shelf extender, and LaunchPad, a Dock extender, from its PasteUp page-layout work-in-progress. In February, Atherton Software began shipping Engage, a much flashier and – yes – engaging piece of software.

If I had written this three months ago, I would have been more excited about the RightBrain products. Both are fine implementations that do their jobs ably, but Engage (and its creator, the terminally hip Jayson Adams) seems to embody the heart and soul of the NeXT.

Engage is a multilevel icon holder that lets you arrange applications and documents in any way you want. On one level, you might place the icons related to a particular project horizontally across the screen. The same applications may appear in your app level arranged in two vertical rows like a double Dock. Since the icons are links to the real locations of the app, you can put things in both places with virtually no overhead.

At \$99 list, Engage is a great buy for anyone, and basic usage is possible with just a little setup. But it is especially useful for those who like to tinker with their environment to get it just right.

I wish I could say the same for LaunchPad and Portfolio, but they are just not as interesting. Things are moving quickly in the NeXT community. It's a game of leapfrog, and right now RightBrain is the one that's been leaped.

Engage: 🍷

LaunchPad/Portfolio: 🍷

Barlow: Come on, Dan, Jayson Adams isn't terminally hip. He's more substantial than that. He is, after all, the author of one of the most important programs on the NeXT, NewsGrazer. This elegant work makes the real stuff of cyberspace, Usenet news groups, available to mere mortals.



Glenn Reid is the exception around the NeXT, the one who leagues at RightBrain has a taste of design. This was product, TouchType. Very right amount of silk in the

I'm not as impressed works okay but they seem find in the Mac shareware

I've been using Engage intuitive and took a bit of addressing one of those 1 over functionality. The E Liberace piano. Until Ne retrofit we can hope for.

Engage: 🍷

LaunchPad/Portfolio

Lavin: Even though seeing NeXTstep running real fast and much nicer dling, excellent ride, tight thought for a moment I

I expected to see tra mises from the crisp Ne find that the interface w quality, was quite good. native NeXT hardware.


So who will this ber base. Companies won't l an all-important second probably the fastest rout

It's not perfect, thou apps directly under NeX tor or other special softw required. With a fast '48 JAWS graphics card, Ne by with less, but probab but up. 🍷

Barlow: This is the obduracy of corporate b and buy '486s so that th to NeXTstep for those n excited about. Never mi ning NeXTstep is the N enough.

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egant work makes the
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Glenn Reid is the exemplar of an interesting new hybrid I'm seeing around the NeXT, the well-dressed hacker. He and the rest and his colleagues at RightBrain have a pretty obvious sense of style and the importance of design. This was clearly in evidence in his first major NeXT product, TouchType. Very elegant. If it were a jacket, there'd be just the right amount of silk in the weave.

I'm not as impressed with RightBrain's utilities, though. Everything works okay but they seem like the sort of useful little widgets one would find in the Mac shareware archives. My thumb is sideways.

I've been using Engage a good deal, even though it isn't particularly intuitive and took a bit of learning to use. It goes as far as it can in addressing one of those NeXTstep areas where visual aesthetics won big over functionality. The Dock is about as form-follows-functional as a Liberace piano. Until NeXT fixes it, Jayson's program is about the best retrofit we can hope for.

Engage: 


LaunchPad/Portfolio: 

NeXTstep '486


Lavin: Even though the implementation we saw at Expo was alpha, seeing NeXTstep running on a PC was a real trip. My first impressions: real fast and much nicer than expected. I was impressed with its solid handling, excellent ride, tight turns, and rack-and-pinion steering. Oops, I thought for a moment I was in a car magazine.

I expected to see trashy colors and raw, fat bits. I expected compromises from the crisp NeXT icons and display. Instead, I was surprised to find that the interface was identical and the color, while not up to NeXT quality, was quite good. Believe it or not, NeXTstep '486 felt faster than native NeXT hardware. It must have been the 50MHz chip in the Dell.

So who will this benefit? It will help bring around the DOS/Windows base. Companies won't have to throw out existing computers. It provides an all-important second source (and then some) for NS hardware. And it's probably the fastest route to a NeXT notebook.

It's not perfect, though. Users might expect to run DOS and Windows apps directly under NeXTstep, but they can't: They need to run an emulator or other special software. Also, a real heavy Intel-based machine is required. With a fast '486, loads of memory and disk, and a specialized JAWS graphics card, NeXTstep PCs are going to be expensive. You can get by with less, but probably won't want to. Still, my thumb is up — surprised, but up. 

Barlow: This is the right move for the wrong reasons. Such is the obduracy of corporate buying habits that many MIS guys will now go out and buy '486s so that the boys in the back room can upgrade from dBASE to NeXTstep for those mission-critical custom apps we're all so darned excited about. Never mind that the most cost-effective machine for running NeXTstep is the NeXT. Apparently, the NeXTstation just isn't ugly enough.

I would rather have seen them port to a really good piece of hardware, like SPARC. You might be right about the laptop, but again I wonder about the platform. I'm typing these words, with a grave sense of disloyalty, on a Mac PowerBook 170. 

Executor-MSW


Barlow: The first time I ran Lotus 1-2-3 under SoftPC on my Mac, it felt to me like Old Tijuana on a party night. I expected some of the same cheap thrills from Executor-MSW, a program that, in its present state of development, runs Microsoft Word for the Mac under NeXTstep. No such luck. As Steve Jobs might say, "It just works!" One quickly forgets there's anything weird about it.

If fact, it works like crazy, producing what amounts to a Mac operating at 10 times the speed of an SE for processor-intensive operations like search and replace or long-document reformatting. Scrolling and other screen-oriented operations are less dazzling, not much quicker than a Mac II. But we can expect this to improve dramatically under NeXTstep 3.0's new bit-map object.


That Executor works at all is something of a miracle, considering the difficulty that Microsoft and Apple have had getting Word to run on Apple's '040 boxes. But what's even more remarkable is that a New Mexico Deadhead named Cliff Matthews is out there peddling what amounts to \$80 Macintoshes and is still being allowed a happy, productive life by Apple legal.

They might actually let him be. Apple has much to gain strategically right now from the injection of Mac software into the UNIX world. In any case, they may have no choice. His careful software emulation of the Mac ROMs has been immaculate to the point of neurosis, and the few things that are problematic with Executor result from his legal meticulousness.

Executor's biggest shortcoming, its requirement that you restart the entire program when you switch Mac applications, results from Cliff's inability to find a legally safe substitute for the Finder. Once he has used this limited version to bootstrap his tiny company, Abacus Research and Design, into a survivable mode, he intends to release a more expensive and full-featured version that should run just about any Macintosh application.

I'm putting my money on Matthews. His promotional material and documentaton looks like it was designed by a total nerd. So, to its credit, does his software. It's an amazing accomplishment. 

Lavin: My favorite thing about Executor is that it allows me to cross environment boundaries so easily. Some of my less-enlightened authors turn in copy on Microsoft Word floppy disks. Having a virtual Mac on my desk certainly saves me lots of effort in dealing with the unwashed masses.

Another favorite thing about Executor is that it will run a lot of other Macintosh programs besides Word. For me, that means instant access to the entire Mac library of games. Also terrific is being part of the Executor community. If you are a joiner, this is for you. An Executor owner can be on a very clubby mailing list and receive folksy free upgrades from Cliff that deliver exactly what he promises. Executor is a winner and so is the company, ARDI. 

Both JOHN PERRY BARLOW and DAN LAVIN are recovering NeXTaholics. They fall off the wagon often. Send them e-mail at: jbarlow@nextworld.com and dlavin@nextworld.com.

The Wizard of Graphics

TIFF, GIF, TGA, PICT. No, this isn't a list of government agencies, it's the range of graphic file formats, supported in different combinations by different graphics software programs, that are a familiar irritation to users who need to move graphics files from one application or platform to another. PixelMagician, a new utility program from B cchus Software, eases the pain by converting files between the most popular formats with the wave of a mouse.

With PixelMagician, you will never need to worry about being able to open or save graphics file again. It supports 16 different formats: BMP, EPS, GIF, IFF, MacPaint, PCX, PICT, PNM, PS, PXM, RAST, TGA, TIFF, XBM, and XWD. In addition to file conversion, this program will change color bit depth, adjust precision, crop,

rotate, resize, and much more.

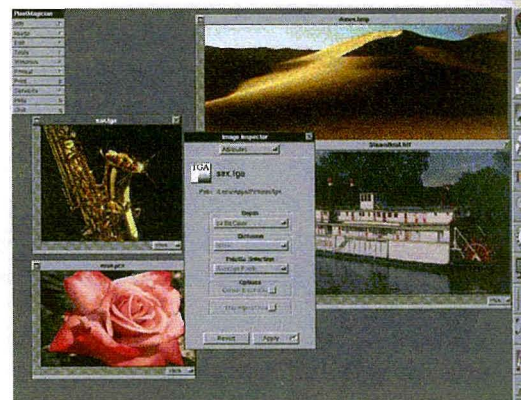
PixelMagician works either as a stand-alone application or through NeXTstep's Services menu, allowing you to bring a variety of images seamlessly into many applications. For example, WriteNow supports only EPS and TIFF images; with PixelMagician, you can import a GIF image that has been invisibly translated into a TIFF image before being placed in your document.

For those who write technical documentation, 72-dpi screen cap-

tures can easily be converted to 92 dpi, exactly matching true screen size. Large scanned images can be converted to smaller pictures, keeping the data intact. An image can be assigned a new background color. Multiple images can even be composited with 14 different alpha channel composite operators. Images can be saved without the alpha channel for platforms that are unable to cope with it.

For file viewing, PixelMagician solves the old need to open different apps to view images saved under different formats. Select a document of each image type in the Workspace and bring up the Inspector from the Tools menu and then Tools from the pop-up list. Click on the PixelMagician icon and OK to make PixelMagician the default application for these formats.

B cchus Software did a great



PixelMagician moves easily between graphic formats.

job designing a workable and elegant user interface. Most of the program's features run via simple panels. The main thrust of the program – format conversion – is straightforward, using a large panel to select the origin images, their destination format, and final location. Our only quibble is that the Inspector panel is not active while saving.

PixelMagician ships on one floppy diskette as an easy Installer Package. A complete paper manual (not available at review time) is included, but a simplified version is

Card Shark

Database applications allow people to store important information in meaningful ways and then retrieve it quickly and flexibly. SpeedDex, from Information Technology Solutions's Rolodex-style card metaphor, provides an easy, yet powerful solution for the simplest database needs.

Most databases divide each record into a set of fields. This allows for searches to be done on particular fields. SpeedDex, on the other hand, is a free-form database, meaning that each record is a single fixed field.

This has the advantage of allowing the addition of an another piece of information in a record – such as a second fax number – without adding a new field to the record in the database. The records

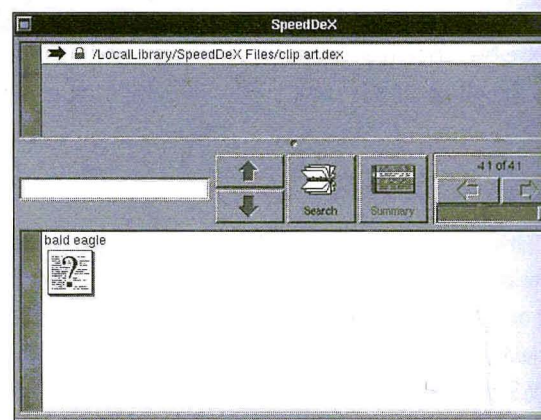
can also contain completely random notes, such as a friend's flight information. The disadvantages to this are the limited flexibility of searches and the difficulty in exporting information to another database.

Users can place text, graphics, or even a file within a SpeedDex record. Text can be searched for within a record, a whole file of records, or over multiple files. Unfortunately, there is

no way of selecting or searching within a subset of records.

A more serious problem resulting from the inability to select multiple records is that users must select and print each record separately – impractical for all but the smallest files. The best workaround is to export the whole database to an ASCII or RTF file and then print a selection from it. Despite the absence of on-line help, an experienced user can figure out SpeedDex quickly. The 76-page manual is complete, full of graphic examples (and more errors than one might expect), and is suitable for those with minimal computer experience.

Files can be imported from tab-delimited ASCII files, Rolonex format, and QuickDex on the Mac.



SpeedDex's fields can contain files as well as text.

Files can be exported into either ASCII or RTF format. Despite shortcomings, SpeedDex is a well-designed product that offers a convenient, easy-to-use solution for the simplest database needs at an affordable price. ♦

by M CARLING

PixelMagician

◆◆◆◆

A must-have universal graphics-format converter for desktop publishing and graphics work of all sorts. Quick, intuitive, and effective, the only thing missing is support for JPEG.

\$299

B cchus Software, 2210 Wilshire Blvd. #330, Santa Monica, CA 90403. 310/820-9145.

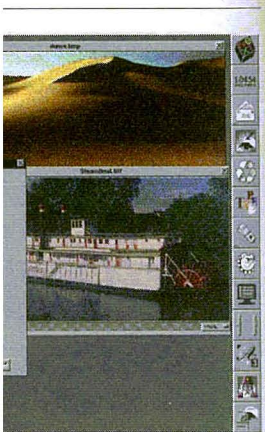
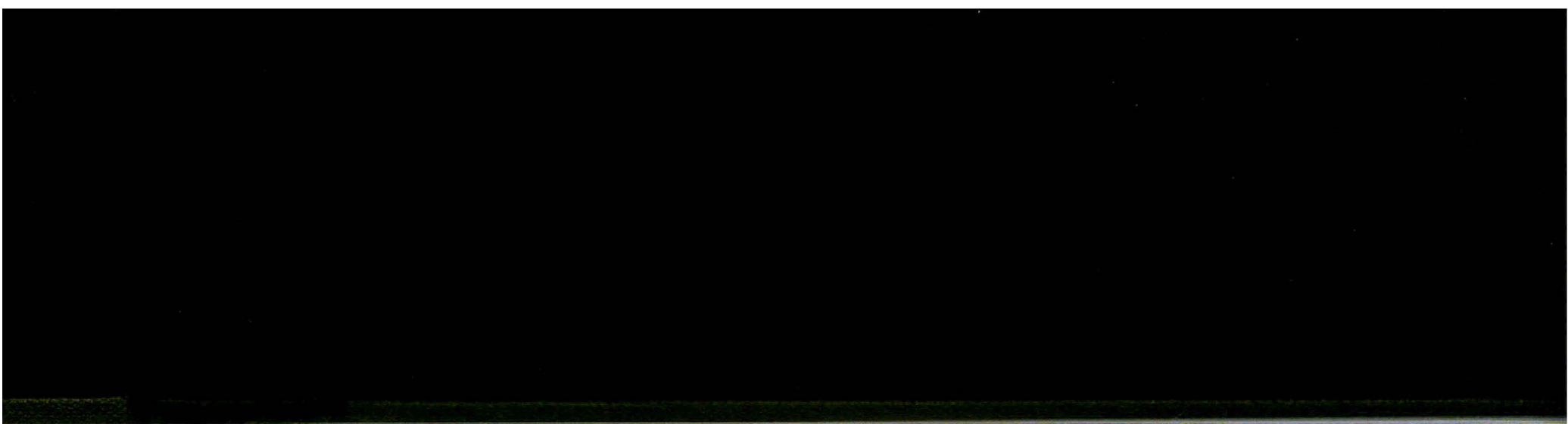
SpeedDex

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A simple, free-form database that is easy to use. Its price makes it a good value for meeting the simplest database needs. Some small improvements would make this an excellent package.

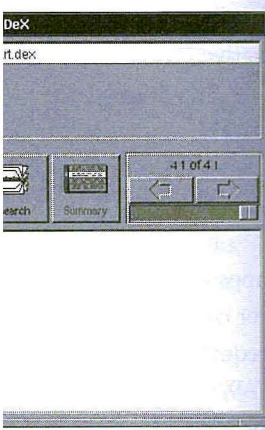
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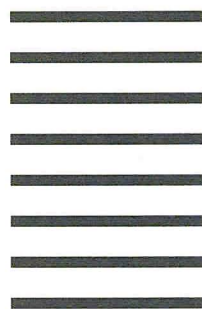
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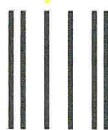
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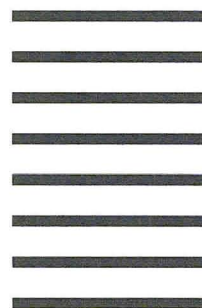
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also included on-line. Baccus provides unlimited technical support via e-mail or telephone.

The missing card in PixelMagician's hand is support for the TIFF format, which isn't particularly common yet. (Baccus plans to support this format in future versions.) The only other problem with the program is that it requires custom file extensions to recognize files it failed to recognize as a .eps file renamed as a .tiff. This may look like a tall order, but files are getting confused and an automatic check feature would be nice.

There is not much to choose from with in deciding whether to purchase PixelMagician. For anyone who needs to work with multiple graphic-file formats, its absence is painfully obvious as they struggle with time-consuming workarounds. This is a key piece of software to add to your bag of tricks. **A**

by RICK REYNOLDS

Organizer

If you think you have too many e-mail messages, too many phone calls, this program will make all the difference in the world. If you can handle 10 contacts per week on the telephone or 200 per week via e-mail, you can handle twice as many if you use them intelligently with OnDuty.

OnDuty, from Digital Implementation Technologies (DIT), is a personal-contact organizer, halfway between a Sharp Windows pocket organizer and a private secretary. Naturally, it provides a Rolodex-like function; it also acts as a Contact tool for tracking the details of any interaction with clients or friends. Also included are tools for building personal calendars, which handle your "to-do" and appointments, a calculator,

REVIEWS

also included on-line. B  chus provides unlimited technical support via e-mail or telephone.

The missing card in PixelMagician's hand is support for the JPEG format, which isn't particularly common yet. (B  chus plans to support this format in future versions.) The only other problem with the program is that it requires correct extensions to recognize files. It failed to recognize a .eps file renamed as a .tiff. This may seem like a tall order, but files are always getting confused and an automatic check feature would be nice.

There is not much to struggle with in deciding whether to buy PixelMagician. For anyone who needs to work with multiple graphic-file formats, its absence is painfully obvious as they struggle with time-consuming workarounds. This is a key piece of software to add to your bag of tricks. ♦

by RICK REYNOLDS

Organizer for the Masses

If you think you get too many e-mail messages and too many phone calls, this program can make all the difference in the world. If you can handle 100 contacts per week on the telephone, or 200 per week via e-mail, you can handle twice as many if you manage them intelligently with OnDuty.

OnDuty, from Digital Instrumentation Technologies (DIT), is a personal-contact organizer, sort of halfway between a Sharp Wizard pocket organizer and a private secretary. Naturally, it provides a Rolodex-like function; it also offers a Contact tool for tracking all the details of any interaction with clients or friends. Also included are tools for building personal calendars, which handle your "to-do" list and appointments, a calculator, and

Now Hear This

Clip music and sound collections are becoming an essential tool for those working in multimedia. Like clip art, they are a godsend for those with limited time, money, or expertise.

All of the sounds in SoundBursts are true CD-quality 16-bit, 44.1KHz stereo samples. Because they are compressed, they take up surprisingly little room on disk.

SoundBursts



Collections of professionally recorded CD-quality stereo clip sounds for use with all NeXT programs that support sound. Sound quality is excellent and both collections are varied enough to suit a variety of purposes, from multimedia to personalizing your workspace.

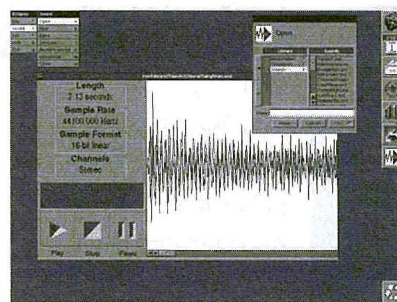
\$99

MIDIapolis Systems, 3208 Lake St. W., Ste. 133, Minneapolis, MN 55416. 612/822-1604.

SoundBursts is broken down into two sets of about 100 sounds each. The Effects collection includes non-musical sounds such as a champagne bottle popping, a door slamming, and a machine gun. Also included are several alternative beep sounds. The musically inclined will be particularly interested in the Percussion Set, a comprehensive collection of percussion sounds. Combined with a multitrack sequencer, these can turn your NeXT into a powerhouse drum machine.

Since sound is so well integrated into the NeXT environment, any NeXT user can benefit from SoundBursts. In fact, MIDIapolis Systems includes a comprehensive user manual that explains exactly how to use these sounds with a variety of programs, including Concurrency, DataPhile, and FrameMaker.

Along with the sounds themselves, SoundBursts includes a sim-



SoundBursts includes over 100 digitized clip sounds.

ple sound-playing application called BIGplay and a trio of UNIX utilities that allow you to play, compress, or get information about a group of sounds all at once. Developers are encouraged to use these sounds within their applications, and all of the sounds come with a full license.

MIDIapolis Systems hopes to follow NeXT in releasing its software on CD-ROM, but for now SoundBursts is shipped on floppies. The disks are clearly labeled and have an index. ♦

by LEE SHERMAN

DIT has a special license program that lets registered users receive a second license to use at home.

The user interface breaks no new ground with its traditional one-record-at-a-time, one-item-in-each-field approach to personal organizers. Performance is adequate to the task. You install OnDuty using a standard NeXT installer program. No acrobatics are required to install a multiuser network version – a big plus for busy sysadmins. .

OnDuty is aimed at individual NeXT users and small workgroups who don't have the work load or disk space for a full SQL database. This is the major difference between OnDuty and Adamation's Who's Calling, with its heavy-duty Ingres SQL engine. Appropriately, the program is priced to capture the lower end of the contact-management market. ♦

by RICK REYNOLDS

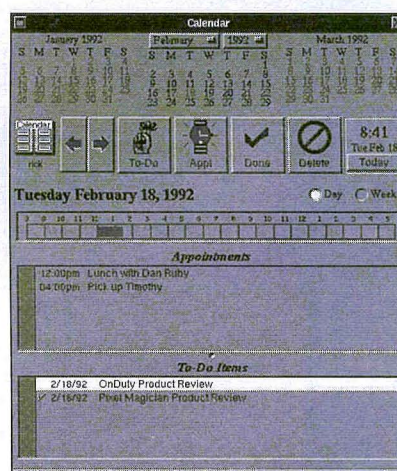
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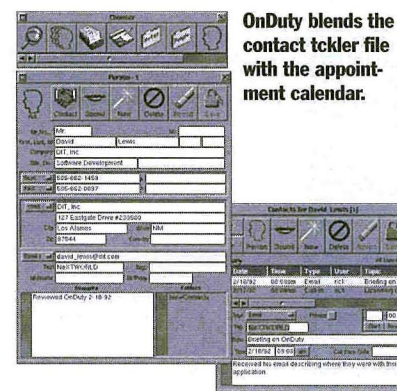
A light-duty contact organizer designed for individual NeXT users and small workgroups. Straightforward with reasonable performance. This first version is a nice start, but take a closer look after it is updated for NeXTstep 3.0.

\$395

Digital Instrumentation Technologies, 127 Eastgate Dr. #20500, Los Alamos, NM 87544. 505/662-1459; e-mail: odrequest@dit.com.



OnDuty balances appointments with daily to-do lists.



OnDuty blends the contact tckler file with the appointment calendar.

Together Again

For the NeXT user who wants to run X Window applications, there is a new contender in the NeXT market. Cub's Systèmes, located in Paris, is offering Cub'X Window. Fully compliant with the MIT specifications for X11R4, this X Window system provides true X11 client/server architecture on the NeXT computer. The Cub'X Window product includes the run-time environment, the development environment, Motif 1.1.3, and on-line documentation.

X Windows is an outgrowth of MIT's attempt to find one graphical environment to run on all platforms ("X on the NeXT," NeXTWORLD Fall 1991). Cub'X offers three server options: X11 running simultaneously with NeXT applications, running in a parallel virtual screen, or running without NeXTstep.

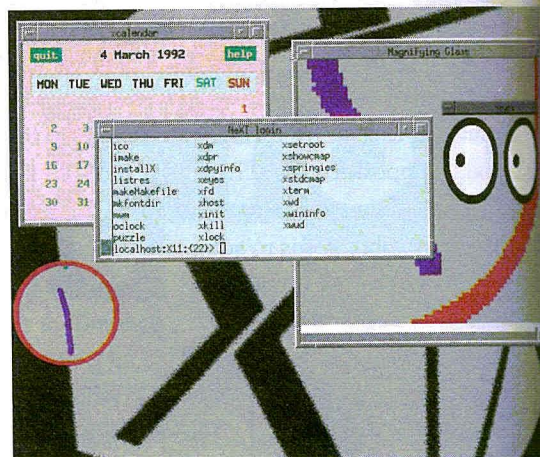
Since X is meant to be the same across platforms, there are three main areas of comparison. The first is installation, a giant issue for a program as complex as X. The second is the method for interfacing with the NeXT, and the third is raw

performance.

Installation is easy with Cub'X Window – it takes up just 25MB of disk space. The number of disks can be intimidating, but the Cub'X manual has easy-to-follow instructions. And the engineers at Cub'x have done a good job of automating the installation process.

The executable app installed on each machine requires a license number provided by Cub'x Systèmes that is keyed off that particular machine. Each machine that runs the software must have a license number, introducing problems at the system-administration level. This copy-protection scheme is aggravating.

The mode of interaction with NeXTstep is changing. The current shipping version, 2.01, runs with NeXTstep and X Windows in separate, parallel screens, between which the user toggles. In this paradigm, the NeXT and X worlds don't really mix; moving between X and NeXTstep requires a mouse gyration. This can be confusing when you are mousing around the NeXT Dock, although command-key shortcuts do help the situation. Alternatively, you can run without the NeXTstep environment at all.



Cub'X mixes in color with X.

The NeXT and X pasteboards interact for cut, copy, and paste between environments.

Version 3.0 (seen in alpha) is a real advance on either of these models. It treats each X window as a separate NeXT-type window within the NeXT environment. This "rootless" model greatly enhances the everyday utility of running X on the NeXT.

Cub'X comes complete with many X Window development tools to build custom X Window applications. Standard libraries are supplied. Although the manual describes many common problems with running and developing X applications on a NeXT computer, you must purchase X development documentation separately.

Cub'X claims to be fast, and our tests bear this out. On a NeXTstation with 32MB of RAM, it took 5 seconds to display a standard X background and cursor, 20 seconds to display the Cub'X background, and 5 more seconds to display X applications – 30 seconds total.

Cub'X, especially with 3.0 in the future, is a strong candidate for any installation that needs X Window functionality. Based on the current shipping products, Cub'X is the best X implementation we've seen so far. ♦

by JOE BORELLO

Cub'X Window 2.01



A very solid X11R4 X Window system for the NeXT computer. Fast and complete version of this popular workstation system software. Includes Motif 1.1.3 tools and libraries and has excellent installation software. Works with or without NeXTstep. Annoying copy-protection scheme.

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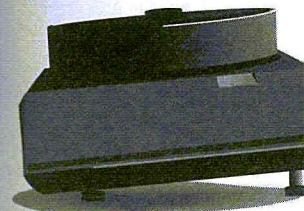
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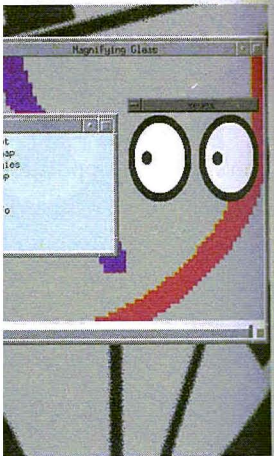
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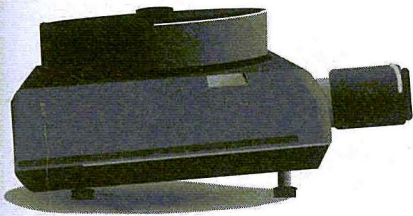
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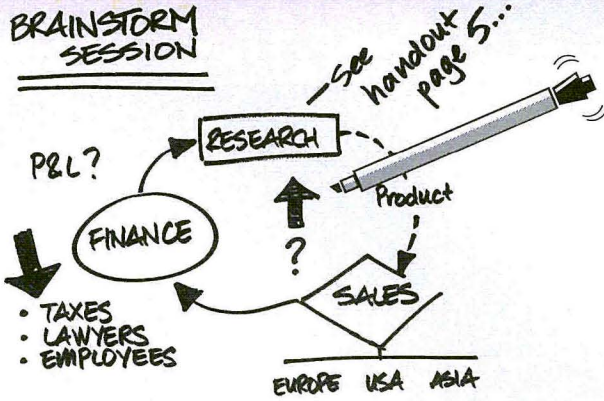
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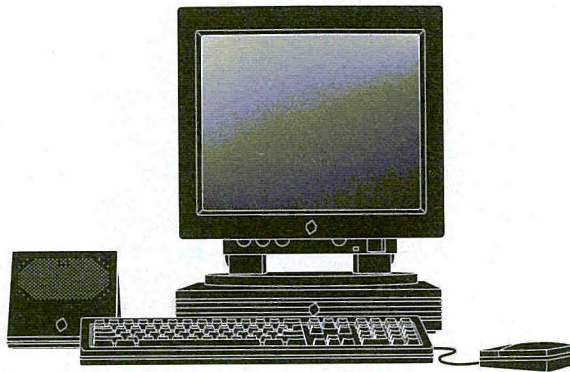
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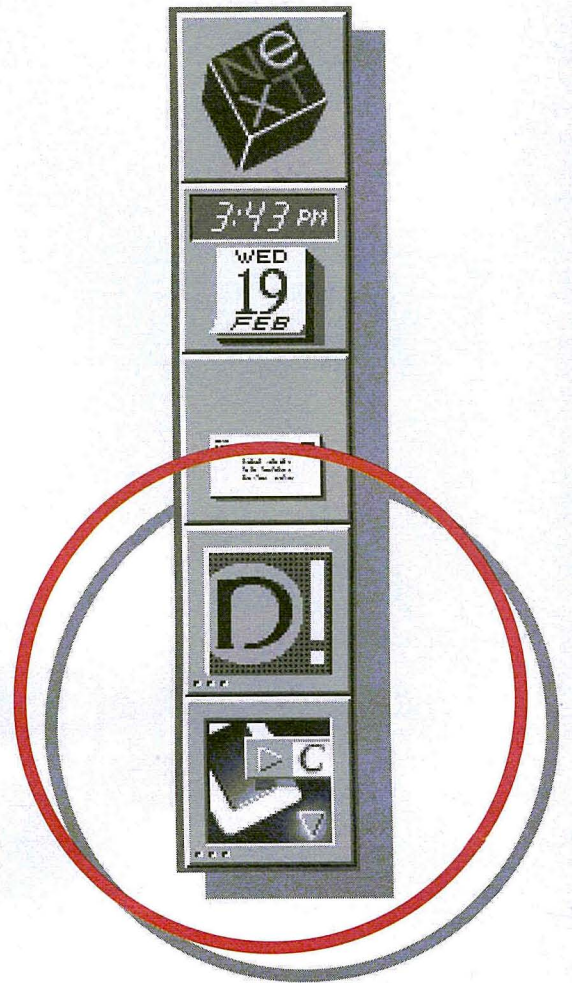
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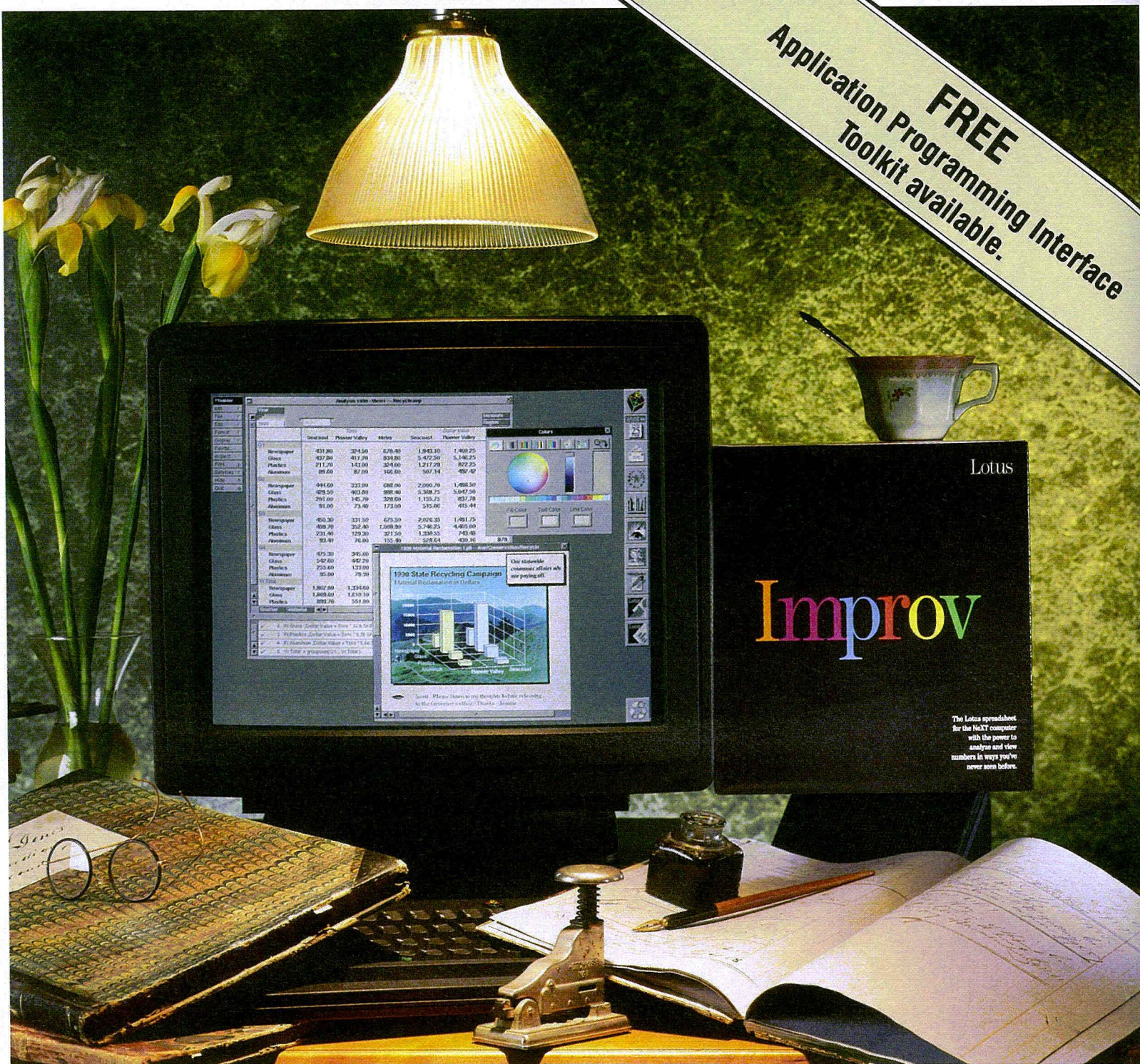
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OPEN THE DOOR TO DOS.

SOFTPC

It's a PC-on-a-disk! Now you can run most MS-DOS applications on your NeXT system with **SoftPC**, the software-based PC emulator. If you depend on a specialized PC program or PC datafile—or have PC-based co-workers—SoftPC can make platform hopping simple and fast. It'll also help you protect your investment in DOS software and training. As *NeXTWORLD* (4/91) said, "This undertaking is so important and so difficult, and SoftPC succeeds so well at it, that SoftPC ranks as one of the most important programs for the NeXT."

SoftPC duplicates an IBM PC/AT with 80286 and 80287 processors, offering C: and D: drives, MS-DOS 3.3 (you can

install 4.0), and support for EGA and CGA video in monochrome and color. There are two printer ports and two communication ports that can be directed to NeXT serial ports or to any UNIX device, process, or file. SoftPC will even transform your NeXT mouse into a Microsoft mouse on the screen.

SoftPC's special features give DOS applications a boost in performance and versatility by allowing you to run multiple DOS windows. NeXT and DOS software can run side by side and share files as easily as copying them. NeXT modems, printers, floppy drives, and other serial peripherals are available to your PC program. And for mega-applications, SoftPC opens up an astounding 32 MB of RAM.

While SoftPC will work on any system running NeXTstep 2.0, a 68040 processor is recommended. Get the power of the NeXT with the rich application library of DOS—isn't that what you've been waiting for? Well, you can have it all with SoftPC.

Insignia Solutions
1456 SoftPC 2.05 **\$329.**

Call 1-800/800-NeXT to order.

NeXTConnection™



Who's Calling?

Clear the desk! Just add **Who's Calling?** to your NeXT computer and forget about traditional Rolodexes, phone logs, message pads, and calendars. You'll have a fully automated client management and scheduling system with modules for tracking client information and conversation histories and sending live network messages. Since it's on your NeXT, you'll be able to attach sound, image, and DEG text files to client records. And for your own special requirements, you can add an unlimited number of custom data fields.

Program features will remind you when to call a client (Calendar), make the call for you (Speed Dialer), provide you with complete data on the person you're talking to (Conversation Manager), and plan the next callback (Tickler). On a NeXT network, you can send live messages to other users, schedule group meetings, and have multiple users query a central database.

If your calls are billable, **Who's Calling?** will automatically calculate client billing from the length of the call. In addition to billing logs, it will also generate mailing labels, client lists, and conversation logs. Other built-in modules include an Advanced Calculator, Talking Alarm Clock, and Area Code and State Finders. You can also display or print upcoming events in daily, weekly, monthly, or six-monthly views. It's everything you need to always know **Who's Calling**.

Adamation ... 30 day MBG
3357 **Who's Calling? 2.0** **\$395.**

MEDIASTATION 2.0

Imagine there are no limits. Imagine orchestrating a flow of sound and vision into exactly what you had in mind. That is the reality of **MediaStation**. Think about how you use a computer. Now add a picture, now sound. Whether you work with personnel files or interactive history teaching, the possibilities are very exciting.

Design your own format, load scanned images, TIFF or EPS files, digitized video and stereo sound. Then edit or add your own cell-by-cell animation. Store the finished entry just like a database record, then organize your entries into a complete desktop presentation.

Now with **Version 2.0**, NeXTdimension users can use direct video output and record their presentations on video-tape. Plus the new *video* datatype allows you to include live video in your presentations. There's also color scanning, more versatile database searches, video disk player control, compression preview, and faster presentation load and response—**MediaStation** is getting better all the time.

MediaStation is fully networked and supports DSP audio devices and the export of multimedia to other applications. Recommended storage devices include read/write optical disks and network file servers. Go ahead, see your dreams come to life on screen.

Imagine, Inc.
1396 **MediaStation 2.0** **\$495.**
1397 **MediaStation (5 pack)** **2995.**
1398 **MediaStation (20 pack)** **8995.**
1400 **MediaStation Educational Package 2.0** **295.**



No hidden charges.

BERNOULLI TRA

Fast enough for the desl

That's the beauty of the **Be Drive**. It weighs just 8.5 po of desk space, but is fast er time) to use as your daily d storage capacity—90 MB p

Bernoullis feature an inn crash virtually impossible t suspended below the fixed don't make any contact. Ar **Removal Disks** feature e polycarbonate cases to wit

NeXTConnection™

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\$495.
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THE '90s ARE REALLY GOING PLACES!

BERNOULLI TRANSPORTABLE DRIVE

Fast enough for the desktop. Light enough to travel. That's the beauty of the **Bernoulli 90 MB Transportable Drive**. It weighs just 8.5 pounds, takes up only 11" x 11" of desk space, but is fast enough (19 ms effective access time) to use as your daily disk drive. And it offers unlimited storage capacity—90 MB per *removable cartridge*.

Bernoullis feature an innovative design that makes a crash virtually impossible because the flexible medium is suspended below the fixed read/write head so the two don't make any contact. And **Bernoulli Gold Standard Removal Disks** feature extremely rugged engineering and polycarbonate cases to withstand shocks up to 1000Gs, the

same as an eight-foot drop. In fact, they're so tough they have a 5-year limited warranty. Buy your cartridges in the **90 MB Tri-Pack** from us and enjoy unlimited storage for well under \$2 per MB.

All it takes to plug your NeXT into unlimited Bernoulli storage is a SCSI cable. And interface kits are available for Macs and PCs, so you can connect to virtually any other host machine. Plus, like the NeXT computers themselves, the Bernoulli 90 MB Transportable switches automatically from 110 to 220 power, so you truly can use it anywhere.

Need some references? The Bernoulli Transportable earned a *MacWorld* 1990 World Class Award, *Byte* Readers' Choice, *InfoWorld* Product of the Year, 4½ Mice from *MacUser*, and

a 1991 *Publish Magazine* Readers' Choice Award. So if you're looking for the speed of a hard disk, the portability of a floppy, and the unlimited storage of a tape drive, you're looking right at a Bernoulli.

IOMEGA ... 1 year warranty	
2224 Bernoulli 90 MB Transportable Drive.....	\$799.
2530 Bernoulli 90 MB Cartridge	149.
2467 Bernoulli 90 MB Tri-Pack	439.
2481 Care Kit	49.

Call 1-800/800-NeXT to order.

NeXTConnection™



INTEL 14.4EX MODEM

V got it all. V.32 and V.32bis compliance; V.42bis and MNP 5 data compression; V.42, MNP 1-4, and TCM error correction. What does it all mean? It means that with Intel's new **14.4EX Modem**, your NeXT computer can talk to just about any other modem in the world with optimal ease, speed, and accuracy. And that means that you'll save time, money and anguish.

Just tell this modem what you want and sit back. It will quickly connect with the other modem (average: under 6 seconds), and negotiate the fastest mutual speed and best error correction and compression modes. It can even re-establish and continue some calls lost due to carrier or power failure. Comes with a 5-year warranty and free technical support.

Intel ... 5 year warranty

3864 14.4EX Modem (requires cable) **\$549.**



MICROPOLIS

Number one with the speed of a bullet. Always at the top of everyone's list of *high-capacity* external drive makers, Micropolis now offers its **280 MB MicroDisk** subsystem for the NeXT. Able to swallow huge image files in a single gulp, this drive can move up to 4 MB of data across an interface in a second and effectively access a file in as little as 4.4 ms.

The speed is impressive, but reliability is the key to confidence. The MicroDisk's 150,000 hour mean-time-between-failures is just part of a package that includes a 5-year drive warranty, a hefty power supply, and a silent high-flow cooling fan. Also available in configurations up to 860 MB.

Micropolis ... 5 year warranty

8984 280 MB MicroDisk (formatted capacity) **\$1589.**
4415 550 MB MicroDisk (formatted capacity) **1889.**
4412 860 MB MicroDisk (formatted capacity) **2599.**



SONY DISKS

Some little known facts about Sony disks. Did you know that Sony invented 3.5" disk technology and media? Or that these **Sony 3.5" Extra-High Density Diskettes** for your NeXT 2.88 MB drive are guaranteed accurate for up to *20 million* passes of your read/write head—now *that's* long life. Did you know that you can transfer data to them at 1 MB per second? Or that, while you should use them at temperatures from 50° to 140° F, you can expose them to temps as low as -40° F in transport? (Which is rather reassuring to those of us in the frozen tundra of Marlow, NH.) So now that you know the facts, keep a supply of these technological wonders on hand for taking your data from place to place or keeping it safe for years.

Sony ... 60 day MBG

3298 3.5" High Density Disks (10 Pack) **\$15.**
6375 3.5" High Density Disks (30 Pack) **42.**
3614 3.5" Extra-High Density Disks (10 Pack) **65.**
5030 3.5" Extra-High Density Disks (20 Pack) **126.**

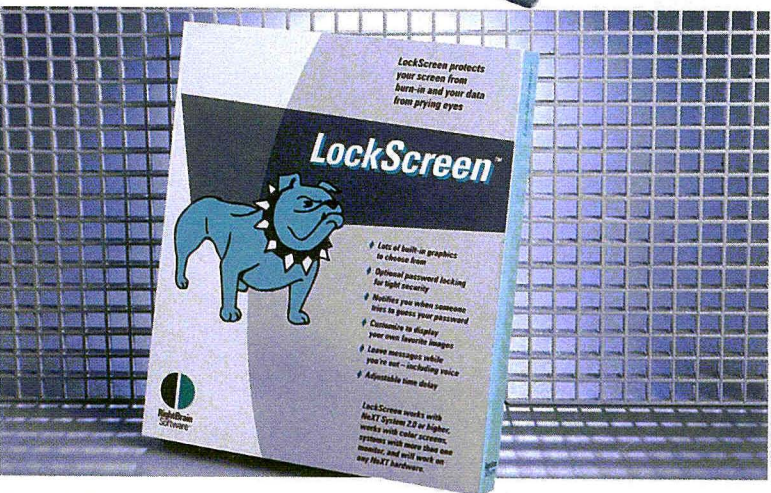
RIGHTBRAIN SOFTWARE

Creative utilities. **LockScreen**, the cult-classic NeXT screen saver, protects your screen from burn-in with the now-famous random word display or your own graphic, and lets you password-protect your screen. **LaunchPad** creates a scrolling list of hundreds of active icons, including documents, folders, and applications, that you can access just like Dock icons.

Design tools. Ideal for anyone who writes, designs, or publishes on a NeXT computer, **Portfolio** lets you store and select your TIFF and EPS files by thumbnail sketch rather than file name. Drag and drop the images into almost any application. RightBrain **Rulers**, a pair of horizontal and vertical guides, float above every application and make aligning objects, confirming image sizes, and centering graphics faster and easier.

RightBrain Software ... 30 day MBG

4148 LockScreen 3.2 **\$79.**
4493 LaunchPad **79.**
4498 Portfolio **79.**
4494 Rulers **79.**



Overnight shipping \$3.

G

LIGHTHOUSE

Diagram! packs graphics p you use graphics in your busi across fast and with high impa of presentation graphics pack: drawings, data, sound, and ev tions quickly and effectively. Ji Diagram! drawing will open *lrr*, *WordPerfect* or *FrameMaker* di recordings. Setting links is as dropping it.

Diagram! is a full-featured gi extras to make drawing, revisi

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and best error correction
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Brain **Rulers**, a pair
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NeXTConnection™



GET ALL YOUR GRAPHICS INTO PERFECT SHAPE.

Lighthouse Design

Diagram! packs graphics power and production. Do you use graphics in your business? To get your message across fast and with high impact? **Diagram!** is a new kind of presentation graphics package that lets you combine drawings, data, sound, and even files from other applications quickly and effectively. Just double-clicking in your Diagram! drawing will open *Improv* spreadsheets, reveal *WordPerfect* or *FrameMaker* documents, or play back voice recordings. Setting links is as easy as dragging in a file and dropping it.

Diagram! is a full-featured graphics application with all the extras to make drawing, revising, and presenting information

a snap. With customizable symbol palettes, you're freed from switching back and forth between conventional tools. Instead, you point to shapes and drag them into your document. If you don't see what you need, modify your palette and you've instantly customized Diagram!. In addition, once you've drawn a line between objects, Diagram! takes over: "rubberbanding" lines to automatically maintain organizational charts, process flows, or decision trees—any structured drawing. Overall, it's one of the biggest innovations in drawing technology since the Macintosh.

This is a graphics program designed for people who use them every day. And you don't have to be in business to enjoy the power of Diagram!—students and universities

have proven to be big fans also. Ask about the special educational discounts available.

Want to get your hands on a lot of great NeXT shareware? The **Big Green Disk** gives you more than 400 megabytes of software, utilities, games, and other useful files on a single optical disk, including bundled GNU programs, MIT's X windowing system, and hundreds of UNIX programs. And for each Big Green Disk sold, Lighthouse Design will contribute \$5 to environmental charities.

Lighthouse Design, Ltd. ... 60 day MBG

8621 Diagram! 1.1 **\$339.**
8663 Big Green Disk (optical disk only) **299.**

Call 1-800/800-NeXT to order.



SEE HOW WELL ADOBE STACKS UP.

ADOBE ILLUSTRATOR

A must for anyone designing a page on a NeXT. With **Adobe Illustrator**, you can start from scratch, create grids for precision drawing, "Auto Trace" existing artwork (including color shades and hues), and/or import EPS and TIFF images. Enhance your visuals with airbrush, contour, highlight, and fill effects using as many colors as you like.

Enter and edit text directly, incorporating various typographic sizes, styles, and colors; and take advantage of sophisticated editing features like text wrap, kerning, vertical shifting, and custom letterforms. Illustrator uses NeXT fonts and color panels, so specifying type and color is easy (PANTONE support, too!). You can edit pages in "preview"

or "preview selection" mode—you'll see changes instantly. And NeXT services like Mail or Librarian simplify file transfers and text searches. Overall, it's the ideal tool for business graphics, knock-out ads or flyers, and/or complex technical illustrations.

Also from Adobe, the new **Adobe TouchType** gives you expert typography in an easy-to-use interface. It's the perfect complement to Adobe Illustrator and all other applications that use or need type. Features include powerful kerning, a font selector that allows you to choose a typeface by viewing its design (rather than a list of names), and the ability to position letters anywhere on the page. And to spruce up your type collection, try the **Adobe Plus Pack**

(22 popular Type 1 PostScript Fonts) and/or **Adobe Type Set Packages** for big savings over buying individual fonts.

Adobe Systems

1827 Adobe Illustrator 3.0	\$459.
9741 Adobe TouchType 1.0	175.
9765 Adobe Plus Pack 1.0	129.
1832 Adobe TypeSet 1 65.	1832 Adobe TypeSet 2 65.
1834 Adobe TypeSet 3	129.

Aachen, Revue,

University Roman, *Freestyle Script*

Bodoni 1

Adobe Caslon™

ADOBE CASLON EXPERT COLLECTION

Century Old Style

COPPERPLATE GOTHIC

ITC Fenice®

Futura® 1

Futura 2

Garamond 3*

Adobe Garamond®

ITC Garamond® 2

ITC Garamond Condensed

Gill Sans® 1

Gill Sans 2

Goudy 1

Helvetica® Condensed

Helvetica Neue 1

Helvetica Neue 3

LITHOS®

Minion™

Mistral, *Reporter No. 2*

News Gothic

Xuprial, *Cascade*, *Medici*

Optima®

Sonata *♩ 123*

Tekton™

Univers® Condensed

Adobe Wood Type 2

Birch™

Blackoak™

Madrone™

Poplar™

Willow™

Fast and flexible font control. view the entire character set they look in text format? You illustration, and presentation combinations, kern pairs, an Accessing a unique character TypeView installs directly i complete tasks that would ne manual—and will give you th of before.

RightBrain Software ...
4496 TypeView 1.0

Maps for desktop publishing graphics at your fingertips! W it easy to create attractive ma ize maps with *Adobe Illustrat* Maps feature country/state bo feature is a separate object, y graphics to create your own c world continents, plus detailed ries. Now available on CD-ROM

MicroMaps ... 30 day MB
9276 MapArt 1.0

2337 MapArt 1.0 (CD-ROM) .

Talking turkey in space. Ev a good, aggressive space garr grab your headphones and sel rons of nasties and photon-pui verse of asteroids. If you're on graphics and DSP generated s cate with other players, monitor experience the Space Turkey gc figure out on your own—some

Lighthouse Design, Ltd. ...
3315 Void 2.0 (3 user license) .

Three little jewels. Protect y system up, saving only the new learned with its own NeXTStep i Enjoy voice-control with **Phra** between words and phrases to: it to type your voice mail or reh Need easy data entry, flexible immediate entry of data without in a PostScript or TIFF file as a I work and can be refined without

Teledia
2513 Backup Master 1.0

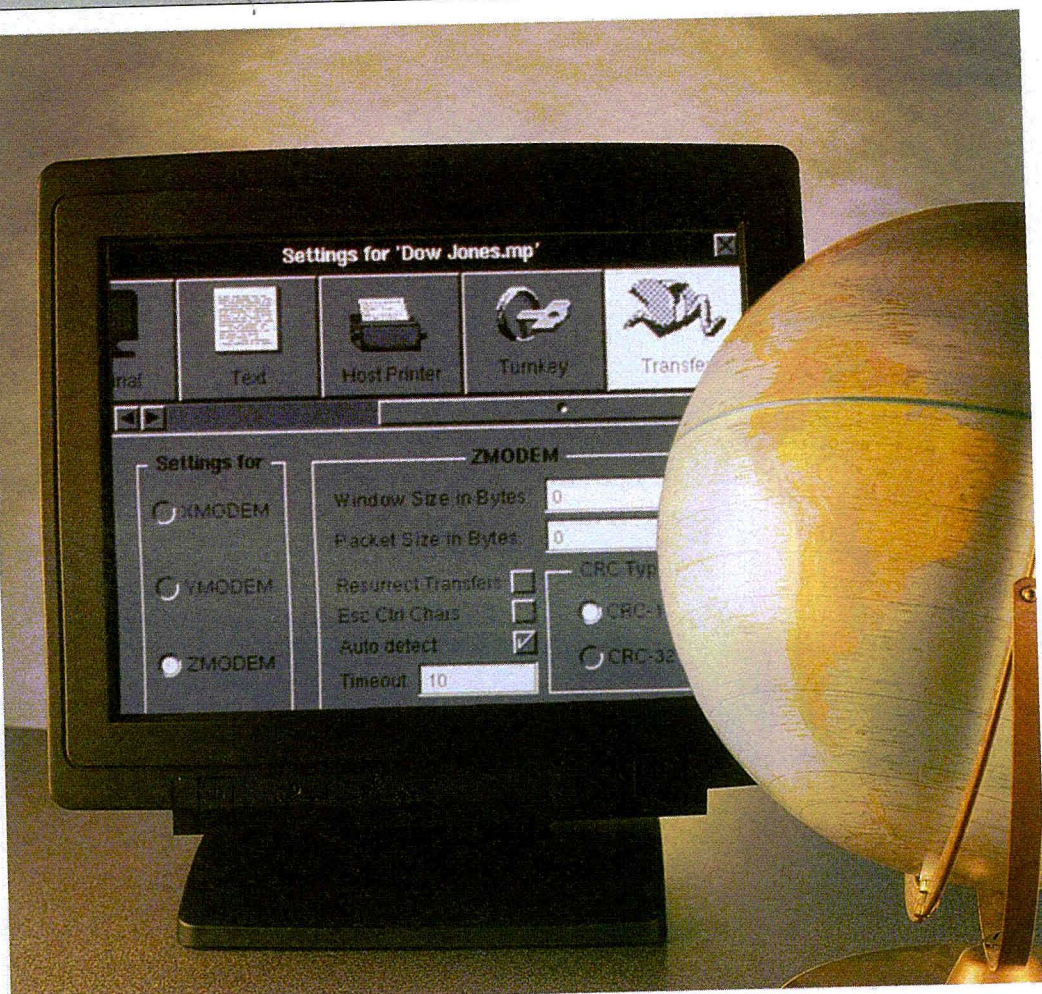
2514 PhrasePlayer 2.0

4726 FileMaster 1.0

Corporate, educational, and government accounts welcome.

Call 1-800/800-NeXT to order.

NeXTConnection™



MICROPHONE II

Great communications software has arrived. With **MicroPhone II**, you'll have easy, intuitive communications software that takes full advantage of NeXT capabilities (R.I.P. tip).

Watch in amazement or, better yet, do something else entirely, while MicroPhone II dials your mail service and automatically downloads your messages in the background.

Next time you log onto your favorite service, turn on the *Watch Me* feature and your keystrokes will be saved. Give the resulting script a button and you're never more than a click away. If you've written MicroPhone scripts in Windows or on the Mac, you'll discover you can use them on the NeXT with little or no modification.

Included are ready-to-run front ends for the most popular services, including CompuServe and Internet. You can also build your own NeXT front end with MicroPhone II's enhanced scripting power and NeXT's Interface Builder.

It's so easy to be on-line with MicroPhone II that you'll soon be doubling your pleasure and your productivity with the multi-session capability that allows you to log onto several information services simultaneously. Safely send or receive anything—text, pictures or sound—through a comprehensive set of file transfer protocols such as ASCII, XMODEM, YMODEM, and ZMODEM. Insanely great software for an insanely great computer.

Software Ventures ... 30 day MBG
4759 MicroPhone II 1.0 **\$149.**

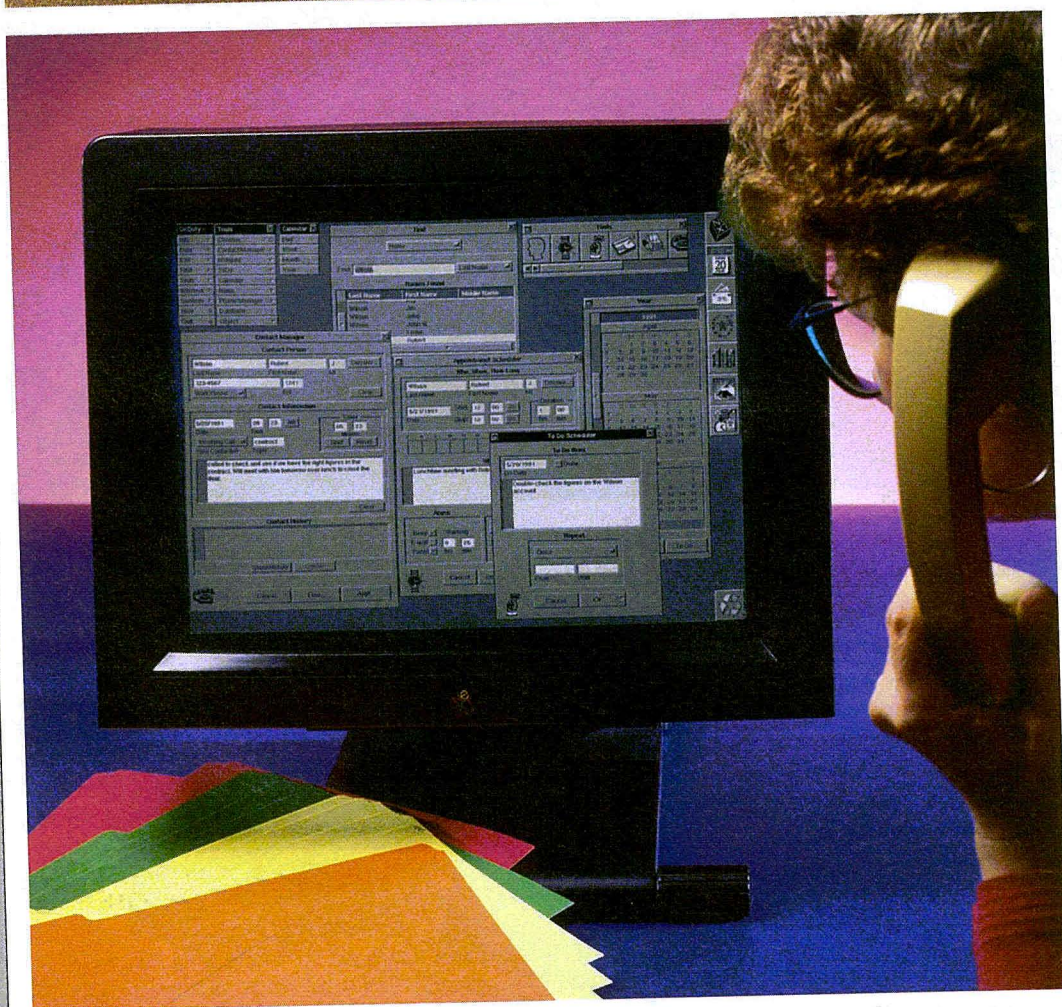
ONDUTY

You deserve an executive secretary. And with **OnDuty**, the information manager for NeXT users, you can get the help you need. OnDuty helps you keep track of appointments, reminders, customers, friends, calls, ideas, sales, anniversaries, birthdays—you name it. Extensive preferences make OnDuty work the way you do, and custom folders let you organize names and notes in just the way you need.

The Calendar comes with a scheduler to assist you in finding time, an alarm to help you be on time, and reminders to keep you from losing time. The Name Manager will never forget one. The Notepad captures inspiration and encourages organization. The Contact Manager tracks calls with a built-in stopwatch and call-backs through the Calendar reminder and lets you maintain an accurate contact history.

Documents can be linked to notes, appointments, and reminders; reports can list all the managed data; and records can be private or public. Browse through your *Rollafie* of names, export names and addresses in mail-merge format, and, with an add-on module, download into the *Sharp Wizard* portable organizer. Does not make coffee.

Digital Instrumentation Tech. ... 1 year warranty
8657 OnDuty 1.0 **\$209.**
8656 FloppyWorks 2.2D **69.**
8661 CubeFloppy 2.9 (with FloppyWorks 2.2D) **579.**



Toll-free technical support.

ISDN SYSTEM

Connect to the new standard of It's called ISDN—Integrated Services digital telecommunications technology for high-speed data transmission. And support it (like Marble's *Teleconnect* ware), you'll be able to handle all y cations from your NeXT computer like multiple sessions over one line.

The **Hayes ISDN System Adapter** is a serial port device that provides for Northern Telecom's ISDN switches switch software releases including

It fully implements the Hayes St: ISDN (which means you can access Hayes-compatible software) and H with supported software, opens the session capability).

Data transmission from 300 bps and voice capabilities include a standard along with battery feed and ring voltage analog devices (e.g., phone, fax, etc.) is truly the new age of telecommunications expect, Hayes is there on the front

Hayes ... 2 year warranty
4998 ISDN System Adapter.

Why scrimp on storage? Get the Peripheral Land Drives. Their new *cartridges*—the ideal choice for around the world. And with its 20 use it as your daily drive. Need more including the **330 MB Hard Disk** of 2.25 to 2.75 MB/sec. We also have 2.88 floppies.

Peripheral Land, Inc. ... 1 year
4847 Infinity 88 Turbo
8888 330 MB Hard Drive.
8547 SuperFloppy 2.88
8893 Infinity 40 MB Cartridge Drive

Toshiba, the NeXT choice in floppy disks to include with each patented the new technology beyond 2.88 MB disk technology. Over 1 *ferrite*—and a new recording technology storage capacity of a conventional rate. Toshiba 2.88 MB floppy disks expertise that's well beyond the makers are just learning about one of their 2.88 MB ED floppies

Toshiba ... lifetime warranty
9754 Toshiba 3.5" ED Floppy Disk
4858 Toshiba 3.5" ED Floppy Disk
9755 Toshiba 3.5" ED Floppy Disk

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I year warranty
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(s 2.2D)..... **579.**

ISDN SYSTEM ADAPTER
Connect to the new standard of voice/data capabilities.
It's called ISDN—Integrated Services Digital Network, a standard digital telecommunications technology for integrated voice and high-speed data transmission. And as software is developed to support it (like Marble's *Teleconnect* remote computing software), you'll be able to handle all your voice and data communications from your NeXT computer with exciting new capabilities like multiple sessions over one line and transfer of voice files.
The **Hayes ISDN System Adapter** is an external RS-232 serial port device that provides compatibility with AT&T and Northern Telecom's ISDN switches and will support future switch software releases including the National ISDN standards.
It fully implements the Hayes Standard AT Command Set for ISDN (which means you can access its power through familiar Hayes-compatible software) and Hayes AutoStream (which, with supported software, opens the door to multiple voice/data session capability).
Data transmission from 300 bps to 38,400 bps is supported, and voice capabilities include a standard analog phone interface along with battery feed and ring voltage for up to three typical analog devices (e.g., phone, fax, and answering machine). This is truly the new age of telecommunications and, as you would expect, Hayes is there on the front lines.

Hayes ... 2 year warranty
4998 ISDN System Adapter..... **\$1199.**

NeXTConnection™



PERIPHERAL LAND DRIVES
Why scrimp on storage? Get the capacity you need now and for years to come with Peripheral Land Drives. Their new **Infinity 88 Turbo** lets you read and write **88 MB removable cartridges**—the ideal choice for archiving and for transporting huge files across the hall or around the world. And with its 20 ms access time (even faster with the built-in buffer) you can use it as your daily drive. Need mega-memory on-call? PLI has plenty of fixed hard drives, too, including the **330 MB Hard Disk**, featuring 14 ms average access time and data transfer rates of 2.25 to 2.75 MB/sec. We also carry PLI's **SuperFloppy 2.88** for reading 720K, 1.44 MB and 2.88 floppies.
Peripheral Land, Inc. ... 1 year warranty
4847 Infinity 88 Turbo **\$879.**
8888 330 MB Hard Drive..... **1749.**
8547 SuperFloppy 2.88 **449.**
8893 Infinity 40 MB Cartridge Drive **669.**



TOSHIBA DISKS
Toshiba, the NeXT choice in 2.88 MB ED Floppy Disks. NeXT chose Toshiba 2.88 MB floppy disks to include with each NeXT system for very good reasons. Toshiba invented and patented the new technology behind 2.88 MB disks and has 14 years of experience with 2.88 MB disk technology. Over that time, Toshiba developed a new recording medium—*barium ferrite*—and a new recording technology—*perpendicular recording*—to bring you twice the storage capacity of a conventional HD diskette with greater data security and twice the transfer rate. Toshiba 2.88 MB floppy disks are made in the USA using a new standard of manufacturing expertise that's well beyond those used today for conventional diskettes. So while other diskette makers are just learning about 2.88 ED disks, Toshiba delivers 14 years of experience in every one of their 2.88 MB ED floppies.
Toshiba ... lifetime warranty
9754 Toshiba 3.5" ED Floppy Disk (single) **\$7.**
4858 Toshiba 3.5" ED Floppy Disks (5 Pack)..... **30.**
9755 Toshiba 3.5" ED Floppy Disks (10 Pack)..... **59.**



Call 1-800/800-NeXT to order.

NeXTConnection™



PROMETHEUS PROMODEMS

The NeXT best thing for telecommunicating! You won't find a faster data/fax modem for your NeXT computer than the **ProModem Ultima**, a 14,400 bps data/9600 bps send/receive fax modem. Fully Hayes compatible, this true V.32bis-compliant modem guarantees raw speed connections of 14,400 bps and up to 57,600 bps throughput utilizing V.42bis/MNP 5 data compression and error correction!

Need to send and receive faxes? With the Ultima, you can do both directly from your computer. The Ultima supports the new Class II standard for fax modems, ensuring compatibility with the built-in fax software in the NeXT operating system. The Class II standard also means you'll be able to use the Ultima with other fax software programs in the future.

If faxing is your main priority and you don't require such a high-speed data modem, the **ProModem 24/96NSR Plus** offers a lower-cost option. You get all the same fax capabilities in a 2400 bps data modem version which, with V.42bis/MNP 5, can still give you up to 9600 bps throughput. And both are backed by a 2-year warranty from a company whose only business is modems!

Prometheus ... 2 year warranty

2197 ProModem Ultima (includes 14.4 Modem) **\$769.**
2207 ProModem 24/96NSR Plus (incl. 2400 Modem) . . **\$339.**



TELECONNECT

Home alone? Stay in touch with Marble Teleconnect.

Whether you're a telecommuter or telestudent, or work in a satellite office, you can stay connected to *all* the resources of your central network, not just a single remote computer. With Teleconnect you'll be able to use your company mail system, specialized printers, and LAN-based applications—all the central office capabilities. If you're tied to the umbilical of a university Internet connection, break free! Now, Teleconnect will run the Internet Protocol (IP) on your NeXT computer over ordinary telephone lines and give you access to applications on your university/corporate net or global Internet.

Marble Teleconnect will communicate with any computer running the SLIP protocol. When connecting two NeXT computers, you have access to all of the inter-machine communication that you would have on your local network. It automatically dials out as required and can automatically hang up after a pre-set idle period. Pre-written scripts support many of the most popular modems (up to 38.4kbps) and the scripting language allows you to add others. Teleconnect can be configured to dial out and answer calls, so other machines can exchange data (such as mail) with yours in your absence. For example, you could have your office NeXTmail periodically transferred to your home. Truly a total communications solution.

Marble Associates

1012 Teleconnect **\$249.**
4096 Teleconnect (student version) **125.**

OBJECTIVE DB

A database manager's best friend. **Designer** for SYBASE automates parts of the design and maintenance of the database.

The highly visual and interactive interface lets you create new database elements from procedures. It will even help you check the consistency of your databases and check the correctness of your triggers and stored procedures.

Best of all, you can work non-destructively on your database changes when you're gone home, you can write them into a file and apply them at the end of the day.

And for the developer... Visual Toolkit

Visual Toolkit links the SQL server to your application, speeds the link between your database engine. A true NeXT text, image, and sound data access interface with buttons and slider arrays.

The Toolkit is a versatile interface that lets you modify a database easily. It will even handle automatic data transfers, and it will even handle SQL inserts and updates. It's a true NeXT application.

Professional Software

4730 Objective DB Designer 1.0
9357 Objective DB Toolkit 2.0

WORD

The NeXT step in word processing

Whether you're a telecommuter or telestudent, or work in a satellite office, you can stay connected to *all* the resources of your central network, not just a single remote computer. With Teleconnect you'll be able to use your company mail system, specialized printers, and LAN-based applications—all the central office capabilities. If you're tied to the umbilical of a university Internet connection, break free! Now, Teleconnect will run the Internet Protocol (IP) on your NeXT computer over ordinary telephone lines and give you access to applications on your university/corporate net or global Internet.

WordPerfect easily integrates with your database. You can place graphics or borders anywhere on a page, a paragraph, or placed in a header and rotate them in myriad ways. This is full-featured word processing.

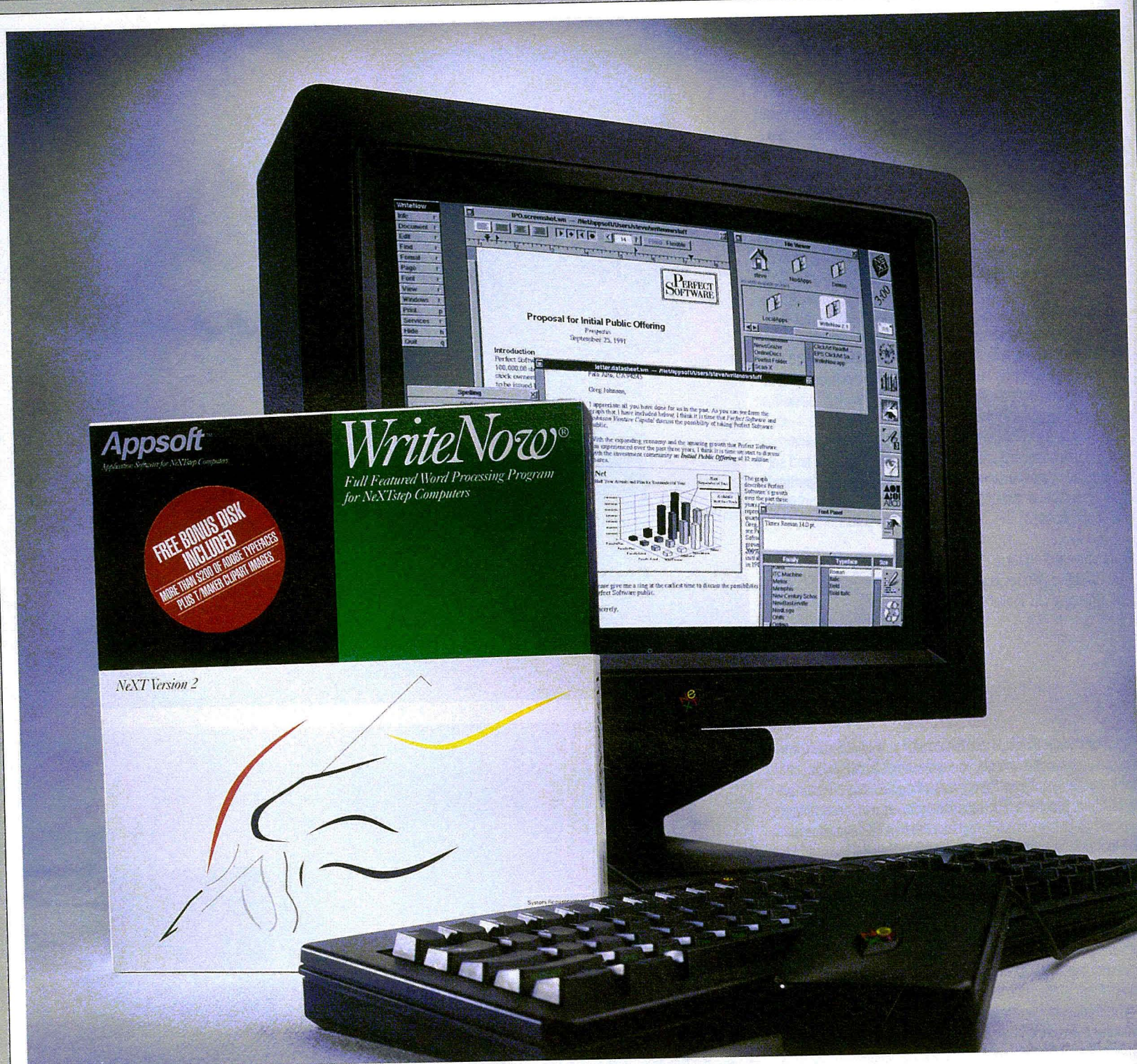
WordPerfect ... 60 day MB

8818 WordPerfect 1.0.1
8859 WordPerfect 1.0.1 (5 pack)
8928 WordPerfect 1.0.1 (20 pack)

No foam peanuts. We use 100% recycled paper to pack.

Call 1-800/800-NeXT to order.

NeXTConnection™



NeXT'S MOST POPULAR WORD PROCESSOR.

WRITE NOW

Full-featured and easy-to-use. A rare combination, but it all comes together in **WriteNow**, developed for NeXTstep by the people at NeXT. WriteNow's use of the NeXT graphical user interface makes word processing simple and intuitive, along with plenty of powerful features that allow you to create professional-looking documents instantly.

Use WriteNow's rulers to format your document paragraph by paragraph or, if you prefer, all the pages at once. The WYSIWYG (what you see is what you get) interface lets you see the results each step of the way. And for those high-impact headlines, the NeXT font panel allows you to apply as many fonts as you may need.

Since a picture is worth a thousand words, just copy and paste an informative graph or other piece of artwork in from your favorite draw or paint program. Once inside WriteNow, the image can be aligned, stretched, or scaled to your dimensions. Working with WriteNow is so easy, you'll never settle for anything less.

WriteNow's automated functions allow you to create perfect documents every time. Use WriteNow's spell checker to inspect your creative prose. Place headers & footers on all or just some of the pages. Add footnotes for special references. And use the search and replace commands to make changes—quickly and efficiently. WriteNow has enough power and versatility to be used for all your word-

processing needs, from simple form letters to complex multi-column newsletters.

Looking for something special? Like, for instance, multi-column formatting, mail merge, programmable data merge, spell checking, bold/italic/underline text formatting, footnotes, headers and footers, search and replace, character and word counting, automatic page numbering and date insertion...whew! WriteNow, the full-powered word processing program developed specifically for NeXTstep, has it all.

Appsoft ... 60 day MBG

4128 WriteNow 2.1	\$159.
4997 WriteNow 2.1 (5 Pack)	739.

Call us anytime from: 8:00 a.m. Monday thru midnight Friday.

Now from App

THE

APPSOF

For professional-looking bu
Appsoft Draw's easy-to-use in
tools, and multi-page capabilities
presentations, informative flyer:
in a flash.

Appsoft Draw's comprehensi
of drawing tools for fast and int
arcs, rectangles, polygons, 24-
images, beziers and more. Con
stunning artwork—including ev
organizational charts to busine
Now use Appsoft Draw's text

NeXTConnection™

Now from Appsoft!



THE BUSINESS GRAPHICS SOLUTION FOR NeXTstep.

APPSOFT DRAW

For professional-looking business graphics. With Appsoft Draw's easy-to-use interface, powerful drawing tools, and multi-page capabilities, you'll be creating effective presentations, informative flyers, and multi-page newsletters in a flash.

Appsoft Draw's comprehensive tool palette offers a host of drawing tools for fast and interactive control of lines, arcs, rectangles, polygons, 24-bit color, TIFF and EPS images, beziers and more. Combine these objects to create stunning artwork—including everything from company organizational charts to business presentations.

Now use Appsoft Draw's text tools to enter and manipu-

late your text headlines and body copy. Change text fonts, stroke, width, kerning, and justification. Scale and rotate your text to any size or angle. Working with Appsoft Draw is so easy, you'll never settle for second best.

And, to make it even easier while creating those high-impact presentations, Appsoft Draw offers a variety of drawing effects. Apply three-dimensional gradient fills, attention-getting arrowheads, solid or dashed lines, and/or separate stroke and fill colors; or set adjustable brightness and contrast levels of TIFF and EPS images.

Once you're finished with your artwork, output to any PostScript printer or imagesetter to create high quality color or black & white prints and slides. And since they run under

NeXTstep, you can be sure that all Appsoft programs provide state-of-the-art compatibility and true work group productivity.

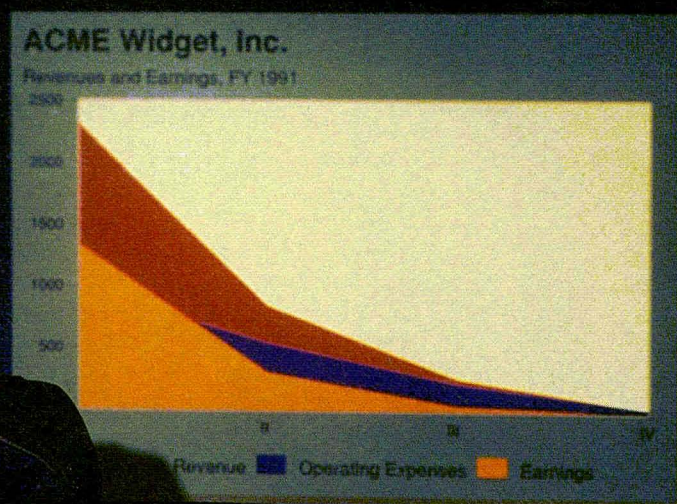
With Appsoft Draw at your fingertips, you'll be producing top-quality forms, illustrations, maps, presentations, slides and more—accurately and automatically. For the business professional, Appsoft Draw removes the tedium between inspiration and presentation.

Appsoft ... 60 day MBG
4465 Draw 2.0 **\$299.**

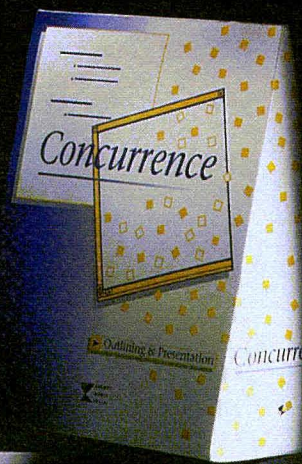
Call 1-800/800-NeXT to order.

NeXTConnection™

Revenues/Earnings



ACME Widget Annual Report



POWERFUL PRESENTATIONS COME TO NEXTSTEP.

CONCURRENCE

"Worth the price of a NeXT all by itself." That's how John Barlow described **Concurrence** (NeXTWORLD Spring '92), NeXTstep's first general-purpose presentation and outlining application, and one of the major highlights of January's NeXTWORLD Expo. Created by the same team behind the ever-popular *Diagram!*, Concurrence is the tool for anyone in the business of preparing and delivering presentations.

With a built-in outliner that can go feature for feature with most word processors, Concurrence is designed to create and maintain structure—from documents such as legal briefs and discussion agendas down to simple to-do lists.

You can even create multiple versions of the same document and modify them all simultaneously with Concurrence's multiple views feature.

And when you want to create a presentation, just push a button—Concurrence will create a presentation view which automatically updates your outline, and vice versa. Create multiple versions of the same presentation using different fonts and backgrounds, and they'll track each other word for word as well. Concurrence also allows you to create auto-running on-line presentations, complete with voice overs, file attachments from other applications (such as *Diagram!* and *Improv*), and an impressive array of PostScript transition effects for maximum on-line impact. Using Concurrence's

Prepare for Mail feature, you can even distribute these presentations across any network for display on other NeXTstep machines.

Need quality output such as 35mm slides? Just send your document via NeXTmail to any number of qualified service bureaus from the guide provided. Or hook your NeXT up to any PostScript output device, such as a color printer, 35mm slide imager, or Linotronic printer. Concurrence will show you the true power behind NeXTstep.

Lighthouse Design, Ltd. ... 60 day MBG
2409 Concurrence 1.0 **\$795.**

No foam peanuts. We use 100% recycled paper to pack.

ELEC

Electronic filing arrives. In document management that g type of file—text, TIFF, EPS, el how many files your library cc

ElectroFile from Insight S own classification scheme, ba Because documents can be ir ways, they become much eas text. ElectroFile's retrieval eng which generate fast searches, ments in the library. You can c with just a few keystrokes, the possibilities down to the right looking for, just click "show" image of the original docume interface. Then you can make add notes or important text, a on the document.

Designed to be both power for imaging, cataloging, corre or any activity which can take After all, if you own a NeXT c having the world's most soph on your desk—now, with Elec

Insight Software, Inc. ...
3308 ElectroFile 1.0

OBJECTIVE

No more dated data. Objec automatically links your datab giving them immediate acce: you open a spreadsheet, the the model so you can be cor based on the most up-to-date

OTProvide also lets you br simply by pointing to the dat across databases, specify sc duplicate rows. Your queries and their results can be loade drag queries out of OTProvide

Version 1.0 requires SYBA Toolkit. Version 2.0 will also : be released at the same time

OTProvide is the newest to the first third-party extender [OTPalettes: 2.0] contains for developer efficiency and cor graphing data in custom app links to *Mathematica*), *Sm* restrict and format input), an management functions for s

Objective Technologies

3282 OTProvide 1.0.
9347 [OT Palettes: 2.0] Cho
9346 [OT Palettes: 2.0] Mat
9345 [OT Palettes: 2.0] Sma
9344 [OT Palettes: 2.0] Gra

NeXTConnection™

ELECTROFILE

Electronic filing arrives. Introducing a real solution for document management that gives you the power to locate any type of file—text, TIFF, EPS, etc.—quickly and easily. No matter how many files your library contains.

ElectroFile from Insight Software allows you to build your own classification scheme, based upon your own requirements. Because documents can be indexed and classified in numerous ways, they become much easier to locate—even those without text. ElectroFile's retrieval engine is based upon B*Tree indexes which generate fast searches, regardless of the number of documents in the library. You can design complex search paradigms with just a few keystrokes, thereby reducing thousands of possibilities down to the right one. Once you find the file you're looking for, just click "show" and ElectroFile will display an image of the original document alongside the classification interface. Then you can make corrections, attach other files, add notes or important text, and even record voice messages on the document.

Designed to be both powerful and flexible, ElectroFile is ideal for imaging, cataloging, correspondence, account processing, or any activity which can take advantage of cross-indexing. After all, if you own a NeXT computer you're already halfway to having the world's most sophisticated filing system right there on your desk—now, with ElectroFile, you can go all the way.

Insight Software, Inc. ... 60 day MBG
3308 ElectroFile 1.0 **\$299.**



OBJECTIVE TECHNOLOGIES

No more dated data. Objective Technologies' new **OTProvide** automatically links your database with your *Improv* spreadsheets giving them immediate access to the current data. Every time you open a spreadsheet, the latest data is imported to refresh the model so you can be confident that your calculations are based on the most up-to-date information.

OTProvide also lets you browse through multiple servers, simply by pointing to the data you want. Join multiple tables across databases, specify sort keys, and include or eliminate duplicate rows. Your queries can then be stored and maintained and their results can be loaded into *Improv* models. You can also drag queries out of OTProvide and into any NeXTstep application.

Version 1.0 requires SYBASE and *Improv* with the API Toolkit. Version 2.0 will also access Oracle databases and will be released at the same time as NeXT's DBKit.

OTProvide is the newest tool from Objective Technologies, the first third-party extender of the NeXT Interface Builder. Their [OTPalettes: 2.0] contains four tools designed to enhance developer efficiency and consistency: *GraphPalette* (tools for graphing data in custom applications), *MathPalette* (to create links to *Mathematica*), *SmartFieldPalette* (data input fields that restrict and format input), and *ChooserPalette* (which provides management functions for selection lists).

Objective Technologies
3282 OTProvide 1.0. **\$699.**
9347 [OT Palettes: 2.0] Chooser **429.**
9346 [OT Palettes: 2.0] Math **650.**
9345 [OT Palettes: 2.0] SmartField **650.**
9344 [OT Palettes: 2.0] Graph **1259.**



Call 1-800/800-NeXT to order.

NeXTConnection™



GIVE YOUR OFFICE A BETTER SCAN.

CANON IMAGE SCANNER

Flatbed scanning at 300 dpi, 256 shades of gray. That's just the beginning of the advanced image-handling technology you get with the new gray-scale **Image Scanner IX-30F** from Canon. Its convenient flatbed design accommodates books, text, graphs, drawings, maps, and pictures. The typical page can be scanned in about ten seconds. And there's even an optional document feeder available that will scan up to 20 pages automatically. Plus its small 13.5" x 18.5" footprint makes this one scanner that won't monopolize your desktop.

Bundled with the IX-30F is Canon's **IX-SCANS** software which can emulate from 50 dpi up to as high as 400 dpi with magnification, which enables the Scanner to reproduce photos and other continuous-tone images with great accuracy. You can modify images by enlarging or reducing, and adjusting contrast and brightness. You can also create the special looks you need with functions like image reversal, mirror image, windowing, and downloaded dither patterns.

For further refinements, simply capture your scanned image as a TIFF or EPS file and import it into other applications. Setup is simple—it's a straightforward SCSI connection. For those who aren't yet into the NeXT level of

computing there are also optional interfaces available for connecting to both Macs and PCs.

Whatever your scanning needs—desktop publishing, research, documentation, presentations, etc.—the Canon Image Scanner IX-30F along with Canon IX-SCANS software gives you the combination of speed, resolution, and convenience you need to make it a productive part of your office environment from the day you plug it in.

Canon ... 1 year warranty
3269 Image Scanner IX-30F & IX-SCANS Bundle **\$849.**

DOVEFAX D

Make sure your NeXT can con way. With the combination personal modem, **DoveFax Desktop for I** Group 3 compatible fax makes full interface so you can send all your ing, graphics, page layout, etc.—(the receiving end, you enjoy the p your own computer and printer.

DoveFax features true background telephone directory, on-screen dis answering, fax preview, and even (with graphics and text!).

Best of all, you get optimum qu can send faxes at high-resolution. incoming faxes (on a local or net) highly detailed Display PostScript 200 x 200 dpi or 200 x 100 dpi. N with third-party OCR software for documents to editable texts.

DoveFax Desktop also includes modem that supports a complete services, protocols, applications,

DoveFax Desktop—a low-cost si data with ease. Backed by Dove's 1-year warranty.

Dove ... 1 year warranty
9356 DoveFax Desktop for NeXT (includes 2400 modem) . . .

Easy in and easy out. PLI offer: **Drive** will let you bring data in fr and the **PL DAT Drive** lets you a

The PL CD-ROM Drive uses a f external SCSI ID and termination comes with *enTar* software by Jua full data verification for high reliat Both products include PLI's toll

Peripheral Land, Inc. ... 1 y
8899 PL CD-ROM Drive
2529 PL DAT Drive (2 GB)

Running out of RAM? We can l you start running out of room and business day. Our **4 MB** and **16 I** 80 ns SIMMs that are compatible (monochrome only). We also carr NeXTdimension boards. (The latt workstation we recommend an a you can go ahead and install ther

Memory ... 2 year warranty
8910 4 MB Memory Upgrade Kit
1935 8 MB Memory Upgrade Kit (2 x 4 MB SIMMs, 8 MB tot
8911 16 MB Memory Upgrade Ki

Overnight shipping \$3.

NeXTConnection™

DOVEFAX DESKTOP

Make sure your NeXT can communicate every which way. With the combination personal fax modem and data modem, **DoveFax Desktop for NeXT.** The 9600 bps CCITT Group 3 compatible fax makes full use of the intuitive NeXT fax interface so you can send all your documents—word processing, graphics, page layout, etc.—directly from your NeXT. On the receiving end, you enjoy the privacy of incoming faxes at your own computer and printer.

DoveFax features true background operation, an on-line telephone directory, on-screen display of faxes, automatic answering, fax preview, and even customized cover pages (with graphics and text!).

Best of all, you get optimum quality coming and going. You can send faxes at high-resolution. And when printing out incoming faxes (on a local or networked printer) you can enjoy highly detailed Display PostScript imaging at your choice of 200 x 200 dpi or 200 x 100 dpi. Naturally, it's also compatible with third-party OCR software for converting incoming faxed documents to editable texts.

DoveFax Desktop also includes a Hayes-compatible 2400 bps modem that supports a complete range of communications services, protocols, applications, and electronic bulletin boards.

DoveFax Desktop—a low-cost solution for handling faxes and data with ease. Backed by Dove's solid customer support and 1-year warranty.

Dove ... 1 year warranty
9356 DoveFax Desktop for NeXT
(includes 2400 modem) **\$279.**



PERIPHERAL LAND, INC.

Easy in and easy out. PLI offers two great drives to speed data transfer. The **PL CD-ROM Drive** will let you bring data in from a CD to your hard drive at up to 9 megabytes per minute and the **PL DAT Drive** lets you archive your data to tape at up to 11 megabytes per minute.

The PL CD-ROM Drive uses a fast Sony drive to give you 380 ms access time. It also features external SCSI ID and termination switches and a self-cleaning objective lens. The PL DAT Drive comes with *enTar* software by Juan Pineda, a tar GUI for painless backups. The drive provides full data verification for high reliability and accepts both 1.3 GB and 2 GB DAT tapes.

Both products include PLI's toll-free technical support.

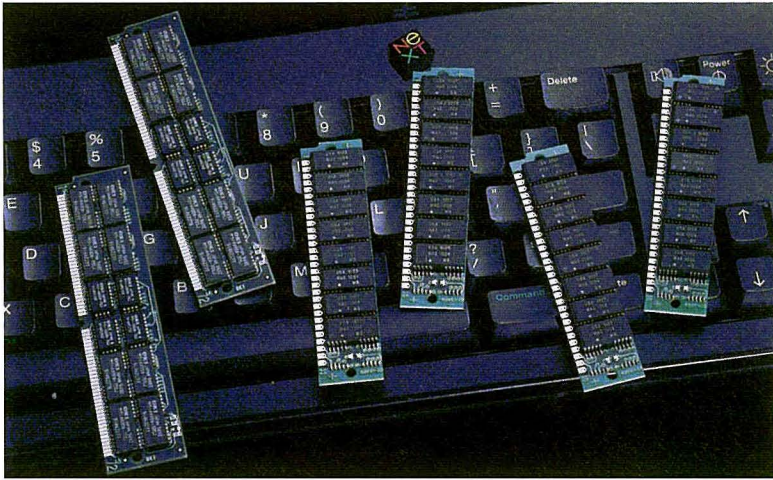
Peripheral Land, Inc. ... 1 year warranty
8899 PL CD-ROM Drive **\$749.**
2529 PL DAT Drive (2 GB) **1999.**



MEMORY UPGRADES

Running out of RAM? We can help you get back to full power overnight. Just call as soon as you start running out of room and we'll send more memory by Airborne for delivery the next business day. Our **4 MB** and **16 MB Memory Upgrade Kits** feature low profile, non-parity, 80 ns SIMMs that are compatible with the 68030 and 68040 cube and the 040 workstation (monochrome only). We also carry **8 MB Memory Upgrade Kits** for NeXTstation Color and NeXTdimension boards. (The latter requires 2 Kits/16 MB at a time.) And Installation? For the workstation we recommend an authorized dealer—otherwise you risk voiding the warranty. But you can go ahead and install them yourself in the cube—we'll provide toll-free tech support.

Memory ... 2 year warranty
8910 4 MB Memory Upgrade Kit (1 x 4 MB SIMM, 4 MB total) **\$149.**
1935 8 MB Memory Upgrade Kit (for NeXTstation Color and NeXTdimension)
(2 x 4 MB SIMMs, 8 MB total) **499.**
8911 16 MB Memory Upgrade Kit (4 x 4 MB SIMMs, 16 MB total) **539.**



Call 1-800/800-NeXT to order.

al interfaces available for
s.
s—desktop publishing,
stations, etc.—the Canon
h Canon IX-SCANS software
eed, resolution, and conven-
lusive part of your office
lug it in.

IX-SCANS Bundle **\$849.**

Corporate Accounts Welcome

Yes, we gladly accept P.O.s. Always have, always will. In fact, we do everything possible to make corporate direct purchasing of computer software and peripherals as easy and enjoyable a process as possible—within the realm of common decency, of course. Many companies (including most of the Fortune 1000 and other just-as-fortunate smaller ones) have accounts with us. If you'd like to open one (or check whether your company already has one), simply call our order line at 800/800-NeXT.

PRODUCT INDEX

GENERAL BUSINESS & PRODUCTIVITY

Adamation ... 30 day MBG (See page E)		
3357	Who's Calling? 2.0	\$395.
3335	Who's Calling? 2.0 (4 pack)	1349.
3334	LiveWire 1.0 (4 pack)	599.
Appsoft ... 60 day MBG (See pages O & P)		
4128	WriteNow 2.1	159.
4997	WriteNow 2.1 (5 pack)	739.
4465	Draw 2.0	299.
DIT ... 1 year warranty (See page K)		
8657	On Duty 1.0 (new price 3/1/92)	279.
Imagine, Inc. (See page E)		
1396	MediaStation 2.0	495.
1397	MediaStation 2.0 (5 pack) (new price 3/1/92)	2199.
1398	MediaStation (20 pack) (new price 3/1/92)	5499.
1400	MediaStation Educational Package 2.0	295.
1394	MediaStation Educational/Network Pkg.	2749.
Informix Software		
3332	Wingz 1.1AB	469.
Insight Software, Inc. ... 60 day MBG (See page R)		
3308	ElectroFile 1.0	299.
Lotus Development (See page C)		
9794	Improv 1.0	549.
1792	Improv/SoftPC	749.
WordPerfect ... 60 day MBG (See page N)		
8818	WordPerfect 1.0.1	299.
8859	(5 pack)	1249.
8928	(20 pack)	3699.

COMMUNICATIONS & DATA TRANSFER

DataViz ... 60 day MBG		
1823	MacLinkPlus/PC 6.0	129.
DIT ... 1 year warranty (See page K)		
8656	FloppyWorks 2.2G	69.
Dove Computer ... 1 year warranty (See page T)		
9356	DoveFax Desktop for NeXT (includes 2400 modem)	279.
Hayes ... 2 year warranty (See page L)		
2307	Smartmodem 2400 (requires cable)	349.
7391	Ultra 9600 Modem (requires cable)	669.
5024	Ultra 14.4 Modem (requires cable)	799.
4998	ISDN System Adapter (requires cable)	1199.
Insignia Solutions (See page D)		
1456	SoftPC 2.05	329.

Intel ... 5 year warranty (See page G)		
5119	2400EX Modem (requires cable)	\$169.
7880	9600EX Modem (requires cable)	469.
3864	14.4EX Modem (requires cable)	549.
Marble Associates (See page M)		
1012	Teleconnect	249.
4096	Teleconnect (student version)	125.
Prometheus ... 2 year warranty (See page M)		
2207	ProModem (includes 2400 Modem)	339.
2197	ProModem Ultima 9600 NSR Plus (includes 14.4 Modem)	769.
Software Ventures ... 30 day MBG (See page K)		
4759	MicroPhone II 1.0	149.
Telebit ... 1 year warranty		
8907	T2500 Modem (requires cable)	939.

PUBLISHING & GRAPHICS

Adobe Systems (See page I)		
1827	Adobe Illustrator 3.0	459.
9765	Adobe Plus Pack 1.0	129.
9741	Adobe TouchType 1.0	175.
1832	Adobe TypeSet 1 or 1833 TypeSet 2	ea. 65.
1834	Adobe TypeSet 3	129.
<i>Adobe fonts now available:</i>		
4767	Aachen, Revue	125.
4801	Adobe Caslon	179.
4754	Adobe Garamond	179.
4747	Adobe Wood Type 2	125.
4745	Bodoni	179.
4800	Caslon Expert	179.
4771	Century Old Style	95.
4775	Copperplate Gothic	239.
4760	Futura 1 or 4758 Futura 2	ea. 179.
4738	Garamond 3	125.
4783	Gill Sans 1	179.
4772	Gill Sans 2	125.
4739	Goudy Old Style	125.
4734	Helvetica Condensed	239.
4746	Helvetica Nueue	179.
4757	Nueue 1	125.
4731	ITC Fenice	239.
4778	ITC Garamond Condensed	239.
4782	ITC Garamond 2	125.
4776	Lithos	125.
4779	Minion	239.
4749	Mistral, Reporter	95.
4768	News Gothic	125.
4774	Nuptial, Cascade, Medici	95.
4773	Optima	125.
4736	Sonata	63.
4777	Tekton	125.
4764	Univers Condensed	179.
Lighthouse Design, Ltd. ... 60 day MBG (See pages H & Q)		
8621	Diagram! 1.1	339.
8663	Big Green Disk (optical disk only)	299.
2409	Concurrence 1.0	795.

MicroMaps ... 30 day MBG (See page J)		
9276	MapArt 1.0	\$95.
2337	MapArt 1.0 (CD-ROM)	95.
T/Maker ... 30 day MBG		
1185	ClickArt 1.0	195.
Vivid Publishing ... 30 day MBG (See page J)		
4496	TypeView 1.0	99.

RECREATIONAL

Athena Design ... 30 day MBG		
9457	Culture Shock 1.0	22.
3876	(color)	25.
David S. Joerg Productions ... 30 day MBG		
4846	Ragnarok	39.
Lighthouse Design, Ltd. ... 60 day MBG (See page J)		
3315	Void 2.0 (3 user license)	99.

VIDEO & SOUND

Metaresearch ... 1 year warranty		
9682	Digital Ears	499.
9683	Digital Ears (with SoundWorks)	669.
9681	Digital Eye (monochrome)	829.
4848	Color Digital Eye	995.
9680	SoundWorks 2.0	269.

UTILITIES

Agog, Inc. ... 30 day MBG		
1476	Squash! 1.0	79.
1478	Squash! 1.0 (10 pack)	699.
1479	Squash! Educational 1.0	49.
1481	Squash! Educational 1.0 (10 pack)	429.
Rightbrain Software ... 30 day MBG (See page G)		
4148	LockScreen 3.2	79.
4493	LaunchPad	79.
4498	Portfolio	79.
4494	Rulers	79.
Teledia (See page J)		
2513	Backup Master 1.0	249.
2514	Phrase Player 2.0	129.
4726	FileMaster 1.0	299.

PROGRAMMING & MATH TOOLS

Absoft		
8898	Fortran 77 3.1	839.
Objective Technologies (See page R)		
9347	[OT Palettes: 2.0] Chooser	429.
9346	[OT Palettes: 2.0] Math	650.
9345	[OT Palettes: 2.0] SmartField	650.
9344	[OT Palettes: 2.0] Graph	1259.
3282	OTProvide 1.0	699.
ONyX Systems ... 30 day MBG		
2340	BugByte 2.1	239.

Professional Software
(See page N)

4730	Objective DB Design
9357	Objective DB Toolkit
Triakis ... 30 day MBG	
1963	T-Calc 1.0
1965	Math++ 3.0
1966	DAN, the Data Analyst
Wolfram Research	
2516	Mathematica 2.0

INPUT/OUTPUT

American Power ...	
7105	Smart-UPS 600
9365	Smart-UPS 900
9364	Smart-UPS 1250
9366	Smart-UPS 2000
7107	Back-UPS 450
3823	Back-UPS 600
7110	Back-UPS 800
7109	Back-UPS 1200
Canon ... 1 year warranty (See page S)	
3269	Image Scanner IX-30
Safe Power System	
6747	400S Power Backup
7913	650 VA Backup
Tripp Lite ... 2 year warranty	
6018	LC1200 Line Conditioner
6017	LC1800 Line Conditioner

DRIVES & DISKS

All drives require

Cables ... lifetime	
8908	SCSI 1-50 Pin Centronics
8906	SCSI 2-50 Pin Centronics
8909	50 Pin-50 Pin Centronics
1106	SCSI Terminator
8992	68030 Modem Cable
8991	68040 Modem Cable
1540	Mini DIN 8 to Mini DIN 8
1441	Mini DIN 8 to DB25 Male

OUR

- We accept VISA and MASTERCARD.
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- Your card is not charged until the goods are shipped.
- If we must ship a partial order, we will ship the complete order (in the future).
- No sales tax is charged, except in California.
- All U.S. shipments insured.
- International orders U.S. dollars only.
- Manufacturer support and warranty are provided.
- Upon receipt and approval, we will provide immediate shipment of your order.
- Corporate P.O.s are accepted.
- C.O.D. maximum is \$1000.
- 120-day limited warranty on defective software.
- Defective software replaced at our discretion. All items are subject to change without notice.
- Order lines: Open continuously.
- Business offices: Call 603-883-8838.

Call 1-800/800-NeXT to order.

NeXTConnection™

Professional Software
(See page N)

4730	Objective DB Designer 1.0.	\$599.
9357	Objective DB Toolkit 2.0	895.
Triakis ... 30 day MBG		
1963	T-Calc 1.0.	59.
1965	Math++ 3.0.	199.
1966	DAN, the Data ANalyzer 2.0	269.
Wolfram Research ... 30 day MBG		
2516	Mathematica 2.0	1699.

INPUT/OUTPUT

American Power ... 2 year warranty

7105	Smart-UPS 600	425.
9365	Smart-UPS 900	669.
9364	Smart-UPS 1250	879.
9366	Smart-UPS 2000	1339.
7107	Back-UPS 450	235.
3823	Back-UPS 600	299.
7110	Back-UPS 800	599.
7109	Back-UPS 1200	799.

Canon ... 1 year warranty
(See page S)

3269	Image Scanner IX-30F & IX-SCANS Bundle	849.
Safe Power Systems ... 2 year warranty		
6747	400S Power Backup.	399.
7913	650 VA Backup	459.
Tripp Lite ... 2 year warranty		
6018	LC1200 Line Conditioner	159.
6017	LC1800 Line Conditioner	209.

DRIVES & CABLES

All drives require a SCSI cable.

Cables ... lifetime warranty

8908	SCSI 1-50 Pin Centronics	12.
8906	SCSI 2-50 Pin Centronics (4 ft.)	45.
8909	50 Pin-50 Pin Centronics	15.
1106	SCSI Terminator	29.
8992	68030 Modem Cable (8 ft.)	15.
8991	68040 Modem Cable (8 ft.)	15.
1540	Mini DIN 8 to Mini DIN 8 Null Modem Cable	15.
1441	Mini DIN 8 to DB25 Null Modem Cable	15.

IOMEGA ... 1 year warranty
(See page F)

2530	Bernoulli 90 MB Cartridge	\$149.
2467	Bernoulli 90 MB Tri-Pack.	439.
2224	Bernoulli 90 MB Transportable Drive.	799.
2481	Care Kit	49.

Micropolis ... 5 year warranty
(See page G)

8984	280 MB MicroDisk (formatted capacity)	1589.
4415	550 MB MicroDisk (formatted capacity)	1889.
4412	860 MB MicroDisk (formatted capacity)	2599.
8978	550 MB Internal Hard Drive (15 ms)	1449.
5029	860 MB Internal Hard Drive (15 ms)	2159.

Peripheral Land, Inc. ... 1 year warranty
(See pages L & T)

8887	CD-ROM Caddy (single)	14.
2531	CD-ROM Caddy (10 pack)	99.
8899	PL CD-ROM Drive	749.
8891	320 MB External Hard Drive (11 ms)	1895.
8888	330 MB External Hard Drive (17 ms)	1749.
8889	600 MB External Hard Drive (17 ms)	2095.
8892	635 MB External Hard Drive (12 ms)	2879.
8890	1.2 GB External Hard Drive (15 ms)	3295.
8893	Infinity 40 MB Cartridge Drive.	669.
8894	Infinity Twin 40 MB Cartridge Drive	1195.
8905	SCSI 2 to Centronix Cable (50 pin)	49.
8547	SuperFloppy 2.88	449.
4847	Infinity 88 Turbo	879.
2529	PL DAT Drive (2 GB)	1999.

ACCESSORIES

Avery ... 60 day MBG

4812	1/2" x 1 3/4" Laser Labels (Qty. 2000)	7.
4811	8 1/2" x 11" Trans.-Laser (Qty. 50)	22.
4807	1" x 2 5/8" Laser Labels (Qty. 3000)	24.
4808	1 1/8" x 4" Laser Labels (Qty. 1400)	24.
5392	3 1/2" Disk Labels (Qty. 630)	29.

Canon ... 90 day warranty

9811	512 MB Optical Disk (MO-502m)	175.
------	-------------------------------	------

Curtis Manufacturing ... lifetime warranty

1718	3.5" Disk File (DB-2) (holds 40)	8.
9757	Top Shelf (TS-1)	18.
5985	Safe Fax (SF-1) (1 year warranty)	19.

1713	Filtered Safe Strip (SPF-3) (1 year warranty)	\$24.
1707	Ruby (SPF-2)	55.
1708	Ruby Plus (SPF-2+)	65.
5832	Ruby Remote (SPFR-2)	65.

Hewlett-Packard ... 120 day warranty

8099	Toner Cartridge for NeXT Printer.	95.
1542	Toner Cartridge for NeXT Printer (3 pack)	269.

Memory ... 2 year warranty
(See page T)

8790	1 MB SIMM (80ns)	45.
9284	1 MB SIMM (80ns, set of 4)	149.
8910	4 MB Memory Upgrade Kit.	149.
1935	8 MB Memory Upgrade Kit	
	(for NeXTstation Color & NeXTdimension)	499.
8911	16 MB Memory Upgrade Kit.	539.

Moustrak ... lifetime warranty

8576	Mouspad: black (7" x 9")	8.
2694	Mouspad: blue (7" x 9")	8.
2699	Mouspad: gray (7" x 9")	8.
8548	Mouspad: black (9" x 11")	9.
2692	Mouspad: blue (9" x 11")	9.
2697	Mouspad: gray (9" x 11")	9.
2693	Moustrak L/F: blue (9" x 11")	10.
2698	Moustrak L/F: gray (9" x 11")	10.

Pacific Micro ... 1 year warranty

8244	External Hard Drive Enclosure	469.
------	-------------------------------	------

Sony ... 60 day MBG
(See page G)

3298	3.5" High Density Disks (10 pack)	15.
6375	3.5" High Density Disks (30 pack)	42.
3614	3.5" Extra-High Density Disks (10 pack)	65.
5030	3.5" Extra-High Density Disks (20 pack)	126.
1603	DG60M 4mm Data Cartridges (1.3 GB)	16.
2520	DG90M 4mm Data Cartridges (2 GB)	22.

SyQuest ... 60 day MBG

6592	SyQuest Cartridge (44 MB)	69.
9728	SyQuest Cartridge (44 MB, 10 pack)	649.
3603	SyQuest Cartridge (88 MB)	110.
3600	SyQuest Cartridge (88 MB, 10 pack)	999.

Toshiba ... lifetime warranty
(See page L)

9754	3.5" Extra-High Density Disk (single)	7.
4858	3.5" Extra-High Density Disks (5 pack)	30.
9755	3.5" Extra-High Density Disks (10 pack)	59.

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Call 1-800/800-NeXT to order.

These days, there are two kinds of companies developing third-party programs for NeXTstep: small, energetic companies, and the big guys.

The small companies are usually hungry start-ups. They're totally committed to the platform. They've gone bananas over Interface Builder and Objective-C. They worship the Application Kit and recite NeXT's technical documentation in their sleep. They're the lean-and-mean companies like Adamation, Stone Design, and Lighthouse Design, and they're bringing out new applications five to ten times faster than they would be able to on any other platform.

Then there are the big players. These companies see NeXTstep as one of their many sidelines. When they bring their product to NeXTstep, they port their entire program, user interface and all.

Take SAS, a statistical-applications program, as an example. SAS on the NeXT looks exactly like SAS on the Sun – it even has OpenLook-style pull-down windows. Rather than use NeXT's Application Kit, SAS ported its own. The result is that nothing works properly: The program doesn't interface with NeXT's cut-and-paste system; there is no Services menu; menus don't pull off; there are no command-key equivalents; and text doesn't move when you drag the scroller.

FrameMaker isn't much better. Frame running on a NeXT only looks like it was built with Interface Builder. Rather than utilizing Interface Builder, Frame's engineers developed a subroutine package that translates Frame's internal functions into NeXTstep-like widgets on the screen. A similar library on the Sun makes Frame look like an OpenLook application. Other "compatibility libraries" give Frame Motif and even Macintosh "look and feel" emulation.

Although Frame did a better job than SAS, the page-layout program takes a real hit on performance. Reason: It's not designed to take advantage of the Display PostScript window server.

What these companies are selling, according to their respective sales forces, is interplatform compatibility. Because programs like Frame, SAS, WordPerfect, and Wingz on the NeXT look exactly like their cousins on other platforms, they're supposed to take less time for users to learn when moving from one platform to another.

Having a program "look and feel" the same on a Sun and a NeXT is a great help to a company's marketing staff, because it means that they only need to learn one set of features and commands. But it's a dead-wrong way to bring a program to NeXTstep. The world simply isn't filled with people who want to use a Sun on Mondays, a Mac on Tuesdays, and NeXT the rest of the week.

What's out there is NeXT users who need to work with people using Macintoshes, PCs, and Suns. User interface compatibility doesn't matter one iota – what's important is data-file compatibility. People using PCs and NeXTs simply have to be able to move files back and forth between applications running on different platforms.

But nobody cares if the screens look the same. NeXT users don't want a version of SAS that looks like SAS on every other platform – they

want one that has the "look and feel" of every other NeXTstep application. Ditto for Frame and any other application from the big guys you care to mention.

This is an exceptionally important point to drive home now, as more and more companies are thinking of porting their programs to NeXTstep. The few that I've spoken with say that they're thinking of developing compatibility libraries – like Frame's – to bring their programs over.

That's precisely the wrong thing to do. Here are some guidelines for doing the right thing.

Developer Tip #1: Don't reinvent the wheel. Rather than trying to emulate the AppKit and make your program look like it was written using Interface Builder, take the time to learn Interface Builder and do it right. Send two people from your company to NeXT's Developer Camp. When they come back, let them spend a month just playing around with the machine. In the end, you'll get a faster, easier-to-use, and simply better program.

Developer Tip #2: Follow the interface guidelines. If you're porting an existing program to NeXTstep, keep the program's back end and data-file representation, but throw away the user interface and start over. NeXTstep makes user interfaces so easy that, even if it took you three years to develop your X Window interface, you'll be able to develop a better NeXTstep one from scratch in a few months.

Developer Tip #3: If people can run the same program on their NeXT as they can on their PC or Mac, what's the point in buying a NeXT in the first place?

Developer Tip #4: Dare to be different. Embrace NeXTstep — use it all. A lot of programmers moving to NeXTstep are hesitant to use things like NeXT's streams package, b-tree system, or rich set of functions in the NeXTstep library. After all, a program that uses these

functions is harder to port to another platform. NeXTstep works together as a reliable, integrated whole. Use it all and you'll bring your program to market that much faster.

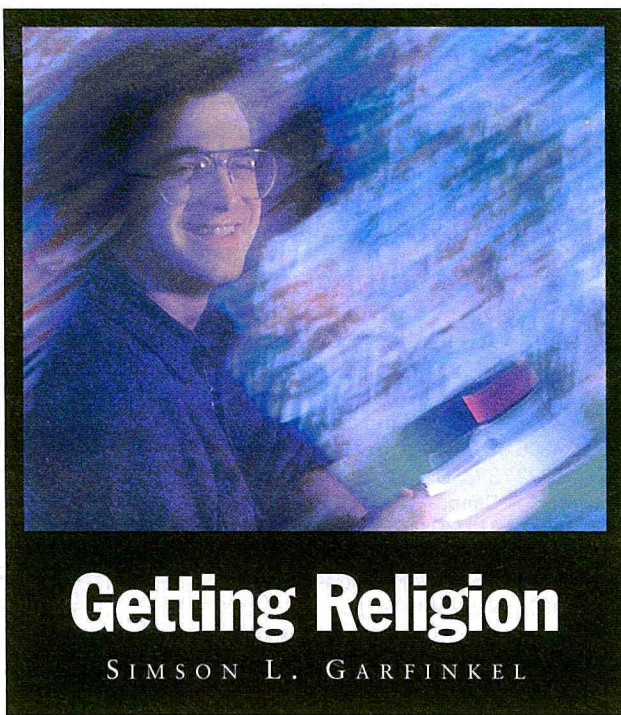
Developer Tip #5: Use Objective-C. Many NeXTstep programmers are afraid to use Objective-C for anything but the user interface. Some want to use C++ for their back ends; others are scared of object-oriented languages in general and want to use ANSI C. Don't be afraid. Objective-C is one of the reasons that NeXTstep's Application Kit is so good. Object-oriented programming is easy, once you get the hang of it, and, as an object-oriented language, Objective-C leaves C++ in the dust.

C++ may be the "industry-standard object-oriented language" these days, but remember: Microsoft Windows is quickly becoming the industry "standard window system." If you want to use standards, get a PC.

If you still need convincing, just look at Lotus. Rather than bringing out 1-2-3 for the NeXT, they went back to the drawing board and created Improv.

'Nuf said. ♦

SIMSON L. GARFINKEL, has a NeXTstation with 32MB of RAM in his Cambridge, Massachusetts, living room.



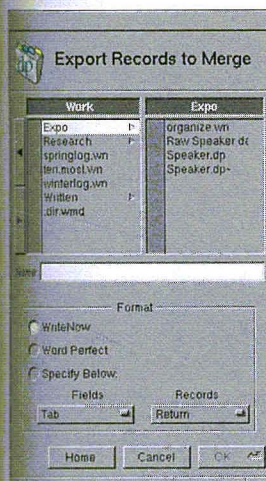
Exporting from DataPhile

by BEN CALICA AND KRISTIN DYER

formats. By the time Expo rolled out, we had the dubious honor of publishing parts of the Expo guide. We sent e-mail confirmations to the speakers and anybody interested in pushing

Database publishing

After settling on the session details, we had the dubious honor of publishing information was in DataPhile, a database publishing program. We were using database jocks forever: We had all the formatted fields in the database file and use a word processor



Exporting from DataPhile to WriteNow helped our DTP task.

desktop publishing program v removed the page breaks by using a global search-and-replace (we didn't think about that at the time.)

After we tracked down all the speakers, we called to ask if they wanted to be listed electronically.

In DataPhile, we made a speaker's e-mail address. We then used DataPhile to find all the speaker's valid e-mail addresses – that is, we used DataPhile to find only records from the database that had a valid e-mail address.

We then returned to the desktop publishing program and used the global search-and-replace to insert the e-mail addresses into the document.

other NeXTstep application. the big guys you care to

drive home now, as more ir programs to NeXTstep. inking of developing com- programs over. e are some guidelines for

. Rather than trying to k like it was written using : Builder and do it right. l's Developer Camp. h just playing around with sier-to-use, and simply

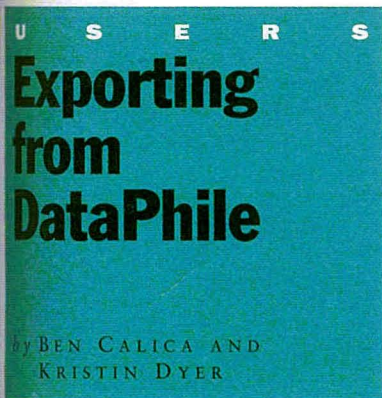
#2: Follow the interface porting an existing pro- keep the program's back resentation, but throw ace and start over. NeXT- rfaces so easy that, even if urs to develop your X Win- l be able to develop a better scratch in a few months. #3: If people can run the eir NeXT as they can on at's the point in buying a ice?

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NeXTstep programmers are r interface. Some want to object-oriented languages id. Objective-C is one of good. Object-oriented and, as an object-oriented

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formats. By the time Expo rolled around, we had used DataPhile for publishing parts of the Expo guide, assisting with a mass fax, and even batching e-mail confirmations to the speakers. The tricks that we learned will help anybody interested in pushing this application to its limits.

Database publishing

After settling on the session descriptions and speakers for the conference, we had the dubious honor of publishing the show guide. Since all the session information was in DataPhile, we faced the same problem that's been plaguing database jocks forever: While it's simple enough to make a report with all the formatted fields in the database, or to dump straight ASCII text into a file and use a word processor to goose things into shape, exporting a formatted text file with all the correct tabs, punctuation, and fonts directly into a desktop publishing program is nearly impossible. Our solution was to use WriteNow's Merge facility.



Exporting from DataPhile to WriteNow helped our DTP task.

desktop publishing program with all bold and italics intact. (We could have removed the page breaks by using WriteNow's Show Markers command, then using a global search-and-replace to eliminate them, but we didn't think about that at the time.)

After we tracked down all the speakers' addresses and phone numbers and called to ask if they wanted to speak, we had to send them confirmation letters. Since we were crunched for time, we decided to do our confirmations electronically.

In DataPhile, we made a new Report view consisting only of each speaker's e-mail address. We then went back to the Main view and told DataPhile to find all the speakers who had accepted, confirmed, and had valid e-mail addresses – that is, e-mail fields that weren't blank. To tell DataPhile to find only records from a field that has something in it, enter:

> " "

(together known as "greater than empty") in that field in the Find panel.

We then returned to the e-mail Report view and told DataPhile to

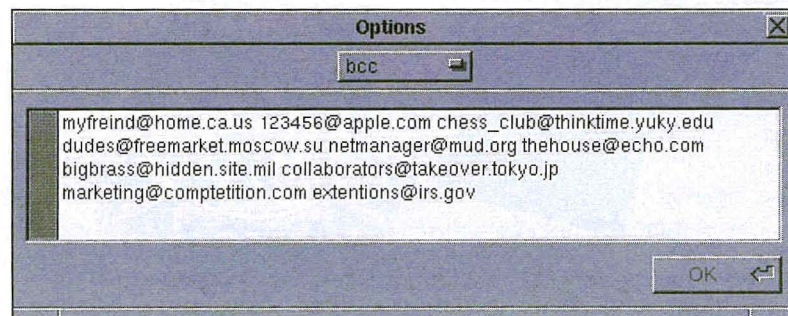
There's nothing like organizing a hundred speakers in only six weeks to push a database to its limits. When we started organizing the User Conference for NeXT-WORLD Expo, we didn't realize that the real help of Stone Design's DataPhile wouldn't be in storing information about our speakers, but in delivering the information to other programs in a variety of useful

retrieve the previous Find. Now we had a view with only the e-mail addresses of the confirmed speakers. We exported this list to a plain ASCII file with the records separated by spaces. We opened this ASCII file in Edit and copied the list into the cut-and-paste buffer by pressing Command-a (Select All) and Command-c (Copy).

Then we went to NeXT's Mail application and opened a Send window. We didn't want everybody to see the list of recipients, so we put our address in the To: field and the speaker list (from the cut-and-paste buffer) in the bcc: field. "Bcc" stands for "blind carbon copy," and you can find it under Mail's Options panel. People getting the message saw only our user name in the To: field. After we pasted in the list of names, we clicked OK to tell Mail that we liked the list we had chosen. We then filled out the rest of the Send panel and clicked the Deliver button.

Time crunch

Luckily, all of the people who didn't have e-mail had reached far enough into the modern age to have fax machines. So we went back to DataPhile and made a Report view with names and fax numbers (you're beginning to get the picture). Then we went to the Main view



We used Mail's blind carbon copy feature to make everyone feel like the only one.

and found all of the records that were confirmed and did not have e-mail addresses by entering

= " "

("equal to empty") in the e-mail field. Back in the name-and-fax Report view, we repeated the previous Find and – voilà – a list of speakers with fax numbers but not e-mail addresses.

Unfortunately we did not have access to a fax modem, so we can't tell you how an automated mass faxing might have worked. Instead, we printed the cover sheets (generated with another WriteNow Merge operation) and enslaved an Expo volunteer to send the cover sheets and confirmation letters. Ah, the best-laid plans . . . As it was, 60 e-mail messages, 40 faxes, and a 38-page show guide aren't too shabby a yield for a simple flat-file database. ♦

BEN CALICA is a free-lance writer and editor based in San Francisco. He was the conference operations manager for NeXT-WORLD Expo. KRISTIN DYER is an editorial intern at NeXTWORLD.

U S E R S

Hints
and Tips

by CHUCK FARNHAM

Illustrator 3.0

Quick and easy TIFF-to-EPS conversion. To easily convert a TIFF image to EPS format, simply launch Illustrator 3.0 and open a new document. Drag your TIFF document from the Workspace over to your new document. Hide the Illustrator layer, and look

in the Workspace for the folder where your copy of Illustrator resides. Your EPS document should be waiting for you, already intelligently named. Remember, however, that this is still an EPS-recorded bit-mapped image and has not become more precise or printable. This format, however, is usable by programs that require an EPS file format. If you need more than this limited solution, Pixel Magician, a nearly universal format converter, will handle this and most other conversions as well.

Concurrence

Alternative way to select items. As an alternative to clicking items to

select them, or Shift-clicking to select multiple items in a row, you can select items by holding down an Alternate key and dragging a box around an item or items. This then selects whatever items are surrounded by the box.

Appsoft Draw

Hidden slide-making capability. Start by choosing a horizontal page layout. Create a master page and drop in your company logo and a gradient field as a background. Choose custom bullets and enter placeholder text at a size appropriate for the bullet. Using the Align tool, group the bullets and type and then choose the Matrix command to produce 5 to 6 bulleted items with equal spacing. The text is still editable within grouped items. Adjust your kerning and spacing as needed.

DataPhile

Sending NeXTmail from within DataPhile.. Hold down an Alternate key and Shift-click a field containing an e-mail address to send NeXTmail to that person.

Label settings for printing Av

laser-printed disk labels using 3.5-inch diskettes. Bring up Reports menu option, then pop-up button and enter 31 the following settings in the and then press OK. (This as dard ruler measurement. Yo under the Info menu option

Top: 0.5

Bottom: 1.75

Left: 0.125

Right: 0.125

Now you can add your cus and it will be replicated over window to save this setup a

Create 1.1

Digital signatures. Zoom to use the pencil tool:

Rotating objects that don't

To rotate splines, lines, pol graph text, simply group th rotate and scale it.

WriteNow

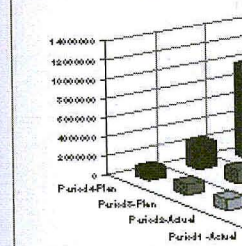
Wrapping text around grap

document, most people as into the document just bef since WriteNow positions need to insert your graphic that you really get text are used the Show Space com View menu to indicate wh into the document.

has experienced over the p with the investment comm

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Please give me a ring at th Perfect Software public.c

CHUCK FARNHAM
sultant specializing in tec
developmental disabilitie

U S E R S

NeXT
Question

by DAN LAVIN

Q: I have set up an Internet account with Portal and use me@mymachine.portal.com as my address. Should I change the name of my home directory from "me" to something more representative? The manual gives me the impression that the "me" account should not be altered.

Robert M. Williams

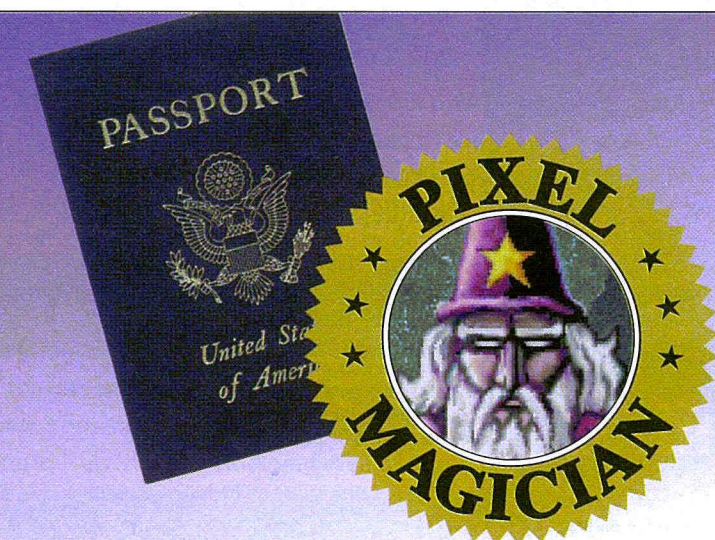
A: Other than changing its password, it is best to leave the "me" account alone. If you want your e-mail sent out to be from "Robert" instead of from "me," you should create a new account for your own use. You'll definately want to do this if you want to give anyone else an account on your machine, so that people on the outside world can send mail to either one of you.

The entire process for creating a new account is described on pages 17-20 of the Network and System Administration book that came with your NeXT computer. The process is as follows:

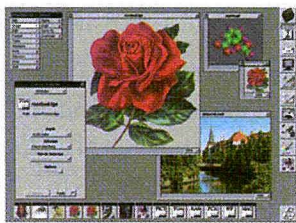
1. Launch the UserManager program that is in the Next Admin directory.
2. Type in the root password
3. Provide the new user's full name, the user's username (one word, all lowercase, eight characters or less), and a password. Make the password difficult to guess.
4. The computer will ask you twice if you are sure. Click "Yes" each time. Then log out and log back in to your new account.

By the way, don't attempt this if you are not the system administrator for your machine or network: There are many complexities to system administration that can bite you if you're not careful.

DAN LAVIN is a senior editor at NeXTWORLD.

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enter placeholder text
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H O W - T O

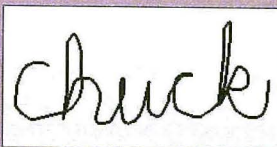
Label settings for printing Avery disk labels. Users can create their own laser-printed disk labels using Avery's Laser Printer Labels (#5196) for 3.5-inch diskettes. Bring up DataPhile's Label window by selecting the Reports menu option, then New Labels. Select Set from the Labels/Page pop-up button and enter **3 by 3** in the Custom Labels window. Enter the following settings in the Margin fields of the main Label window and then press OK. (This assumes you are using inches as your standard ruler measurement. You can change this by selecting Preferences under the Info menu option.)

- Top: 0.5
- Bottom: 1.75
- Left: 0.125
- Right: 0.125

Now you can add your custom art to the Background graphic window, and it will be replicated over all nine labels. Choose Save from the label window to save this setup as a reloadable template.

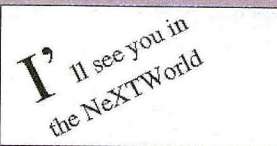
Create 1.1

Digital signatures. Zoom to 200 percent and use the pencil tool:



Rotating objects that don't inherently rotate.

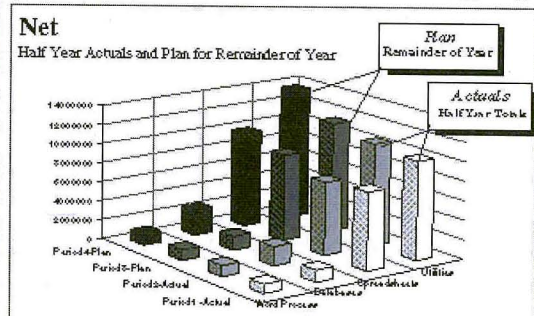
To rotate splines, lines, polylines, and paragraph text, simply group the object, then rotate and scale it.



WriteNow

Wrapping text around graphics. Once you have written your letter or document, most people assume that you need to paste your graphic into the document just before the appropriate paragraph. However, since WriteNow positions graphics from the bottom of the image, you need to insert your graphic up and into the last paragraph to assure that you really get text around a graphic. In the illustration below, we used the Show Space command (Command-space bar) in WriteNow's View menu to indicate where the graphic image was actually placed into the document.

has experienced over the past three years, I think it is time we start to discuss with the investment community an **Initial Public Offering** of 12 million.



Please give me a ring at the earliest time to discuss the possibilities of taking Perfect Software public.

CHUCK FARNHAM is a hardware-support engineer and consultant specializing in teaching computer skills to individuals with developmental disabilities.

DEVELOPERS

Using NeXTstep's Defaults System

by RAY RYAN

If you've written an application for a user base of more than one, you've probably felt the need to allow some kind of customization. You may have called it providing preferences, or parameters, or defaults, or something else – but what you were thinking about was giving users a say in how the program worked after they installed it.

This is a common need, and to help meet it, NeXTstep provides the defaults database, a dual-key database of small text values, in each user's home directory. Defaults provide a way for applications to keep their preference and configuration settings in a central place. It keeps the user's home directory from becoming a mess of dot files and hidden directories, each one written with its own application-specific format.

How does it work?

The defaults system stores values with two keys, an owner and a name. The owner is usually the name of the application that stored the value; the name describes what the value means. The database is stored in two files kept in the user's ~/.NeXT directory – you should never touch those files directly. There are perfectly good function calls for that.

The most obvious use of the defaults database is with your Preferences panel, but this is by no means the only place it's handy. Any value that should be stored on a per-user basis (but that doesn't make sense as part of a document) can probably find its way into the defaults system. One common use is to keep track of an application's panels between sessions: their size and position, and whether the user left them open or closed.

The general question of what belongs in a document and what belongs in the database isn't always straightforward. It's pretty obvious that Emacs key bindings being enabled or disabled should be a preference. When I mail you a document that I've been working on, do you really want to be subject to my control-key preferences? But what about the grid-snapping features of most drawing packages? Different apps have it stored in different places, and what makes sense to me (in the document) may seem like an incredible leap in illogic to you.

Registering your defaults

In the simplest case, there are three basic steps to using defaults from an application. Soon after launching, call NXRegisterDefaults() with an NXDefaultsVector to tell NeXTstep who you are, and the names of the defaults you want to use. When you're actually ready to use a value, fetch it from the database with NXGetDefaultValue(). Use NXWriteDefault() to write them back.

In code, the registration step can look something like this:

```
#import <defaults.h>

...
+ initialize
{
    const NXDefaultsVector MyDefaults = {
        {"AutoSave", "NO"},
        {"NXFont", "Helvetica"},
        {NULL, NULL}
    };
}
```



```
};
NXRegisterDefaults([NXApp appName], MyDefaults);
return self;
}
```

This might be the +initialize method of the class that uses these defaults. Or you could put similar code into your application delegate's -appDidInit: method. Or both. It's perfectly acceptable to call NXRegisterDefaults() more than once.

The "NXDefaultsVector MyDefaults" is a list of name/default value pairs. Note that it ends with "{NULL, NULL}."

When you call NXRegisterDefaults(), the system checks to see if each default you name was specified on the command line (for example, with -AutoSave YES). If not, the system checks the database, first with the owner you provide (in this case "MyApp"), then with owner GLOBAL. If all of these checks fail, the default is created with the value you provide.

Wherever the value finally comes from, it's kept in memory for quick access when you look for it with NXGetDefaultValue().

The NXFont default value is a special one, as are most with the NX prefix. (You should never create your own default value with an NX prefix – that's reserved for NeXT.) NXFont is the value set by the Application Font section of the Preferences app. Text objects look for this value on their own, without you having to lift a finger. If you're using text objects and you want to provide a default-font preference, just store a value with owner "MyApp," and name "NXFont." (Text objects also look for the NXFontSize default.) You should add your own prefix to your default names to avoid clashes with other apps.

Reading defaults from the database

When you're ready to use, say, the auto-save value, you might do something like this:

```
if ([self itsAutoSaveTime] &&
!strcmp(NXGetDefaultValue([NXApp appName], "AutoSave"), "YES"))
{[NXApp delegate] save};
```

(Remember that strcmp() returns zero for strings that match.) NXGetDefault() looks for a value for "AutoSave" with owner "MyApp" first in memory, then in the on-disk database. If that fails (for example, if you hadn't included "AutoSave" when you called NXRegisterDefaults()), it looks under the owner GLOBAL.

Writing out new values for your defaults is straightforward. The simplest thing to do is write out a default as soon as it's changed. For example, the target/action method for the auto-save check box on your Preferences panel might look like this:

```
- setAutoSave:sender
{
NXWriteDefault([NXApp appName], [sender state] ? "YES" : "NO");
return self;
}
```

This updates the MyApp AutoSave value in the memory structure we keep mentioning, and writes it to disk as well.

In addition to the programmer's interface, NeXTstep provides three command line programs – dread, dwrite, and dremove – that give you access to the defaults system. To see all of your defaults, type:

```
localhost> dread -l
```

You can also read a specific value, like:

```
localhost> dread MyApp AutoSave
```

To see all of the values for a particular owner, type:

```
localhost> dread -o MyApp
```

The command dwrite works similarly. Setting a value is as simple as:

```
myhost> dwrite MyApp AutoSave YES
```

You don't have to resort to the command line, either. Floating around the net archives is Marc Davidson's excellent DefaultMgr. This NeXTstep app provides a browser interface to the defaults system. It gives you complete control over existing values, and lets you create and destroy owners and names with menu commands, exactly as you'd expect.

How shouldn't I use it?

You can't go bananas with what you store in the defaults system; it's not a big database manager. You can only fit 1023 characters into a value. And remember, it's for character strings only, not data streams.

And don't expect your users to know anything about dread and dwrite, or about DefaultMgr. If you expect real use to be made of values you store in the defaults system, give people a good way to get at them. ♦

RAY RYAN is one of the founders of Lighthouse Design.

DEVELOPERS

NeXT Question

BY SIMSON L. GARTFINKEL

Q: What's the easiest way to put a printable ASCII representation of a time_t into a TextField?

Judy Koeppel
Somerville, MA

A: Use Objective-C's facility for categories to add a setDateValue: method to the TextField class. Create a new #import file called TextFieldAdditions.h that looks like this:

```
#import <appkit/TextField.h>
#import <sys/time.h>
```

```
@interface TextField(Additions)
- setDateValue:(time_t)time;
@end
```

Place the definition for the Additions category in a file called TextFieldAdditions.m:

```
#import "TextFieldAdditions.h"

@implementation TextField(Additions)
- setDateValue:(time_t)time
{
[self setStringValue:asctime(localtime(&time))];
return self;
}
@end
```

Now you can send any TextField a message like this:

```
[aTextField setDateValue:timeval];
```

And have it look like this:

```
Tue Feb 4 11:17:28 1992
```

DEVELOPERS

Hints and Tips

by ANDREW STONE

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You can easily create a

```
NXZone *myZone = NXCreat
```

Then, instead of using a zone you just created, like t

```
id anObject = [[MyClass all
```

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```
NXDestroyZone(myZone);
```

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Unfortunately, it turns NXApp's windowList is to zone, you've got to follow

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2. Free the Window o
3. Destory the zone.

Otherwise, the next ti

Another type of windo may need explicit freeing) dow objects, and cause yo

Popping with pop-up

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NeXTstep pop-up list popUp: message to a PopU up list on the screen. The trick to displaying the pop button on the screen is to

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DEVELOPERS

Hints and Tips

BY ANDREW STONE

Twilight zone

NeXTstep 2.0 introduced a new memory-handling capability called zone allocation. By telling NeXTstep that you want certain objects to be allocated from the same hunk of memory, you can get significant performance improvements.

For example, you might allocate a Window and all the objects in it from the same zone. That way you reduce the chance of paging when clicking different objects in the window. The system pages instead when you click a different window.

You can easily create a new memory zone. Just use:

```
NXZone *myZone = NXCreateZone(vm_page_size, vm_page_size, NO);
```

Then, instead of using `alloc`, you use `allocFromZone:`, passing in the zone you just created, like this:

```
id anObject = [[MyClass allocFromZone:myZone] init];
```

When you're done with the Window, you don't need to individually free all its objects (which chews cycles) — just throw away the zone:

```
NXDestroyZone(myZone);
```

All this is really just a warm-up for my tip: Freeing memory from a destroyed zone is a guaranteed show stopper. Be careful!

Unfortunately, it turns out that the only way to get a window off NeXTApp's windowList is to free it. To free a Window that's in a different zone, you've got to follow these steps:

1. Set the Window object's contentView to nil.
2. Free the Window object (removing it from the windowList).
3. Destroy the zone.

Otherwise, the next time you access the windowList, adios amigo!

Another type of window that might get on the windowList (and may need explicit freeing) is pop-up list. Remember, they're real Window objects, and cause your newly optimized app to die.

Popping with pop-up lists

Ever want to have a pop-up list that was small on the screen when collapsed but as wide as needed when popped up?

"You just can't do it," said NeXT. We had a need, however, for just such a pop-up when storing users' Find requests in DataPhile, because Find requests can be as arbitrarily complex as the user wants. But if two requests have field structures that are similar at the beginning but different at the end, the pop-up won't reveal any difference. Luckily, I moaned this sad shortcoming of the AppKit to Charles Perkins, who had already solved the problem for Marble Associates's Teleconnect.

NeXTstep pop-up list buttons are really buttons that send the `popUp:` message to a PopUpList object, which in turn displays the pop-up list on the screen. The button that you click is called a cover. The trick to displaying the popped-up selection at a different width from the button on the screen is to insert a custom object between the two.

Such an object is WidePopupManager, which sits between the button and the pop-up list and intercepts the `popUp:` message. NeXT's PopUpList object is fooled into thinking that the manager is the button; this lets you resize the pop-up list itself without changing the size of the cover. The list not popped-up (the cover) looks like this:

```
Organi:Margie, City:Albuqu
```

But when it pops up, you get the full size:

All
All:4783
Name:marg
Organi:Margie, City:Albuqu, State:NM
Organi:Margie, City:Albuqu, State:NM, Name:Margie

Initialize it like this, where "theButton" is the id of a PopUp List you created with Interface Builder:

```
id popUp = [[PopUpList allocFromZone:[self zone]] init];
NXAttachPopUpList(theButton, popUp);
[[WidePopupManager allocFromZone:[theButton zone]]
    initWithButton:theButton andList:popUp];
```

When adding or removing titles to the pop-up, be sure to send the pop-up the `sizeToFit` message.

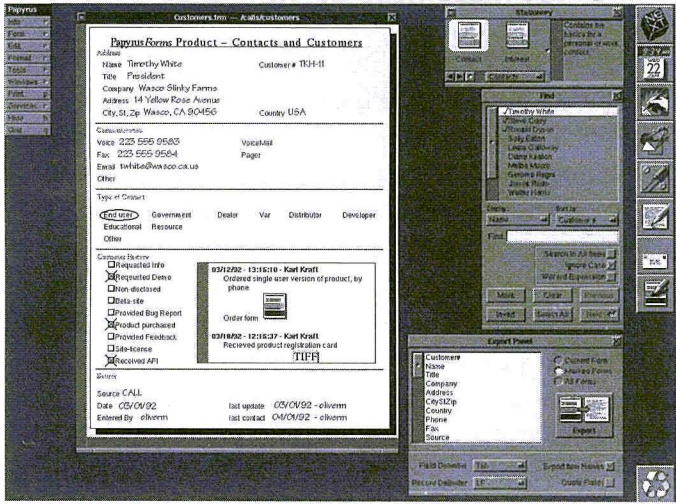
Here's the class interface and implementation:

```
/* WidePopupManager.h */
#import <objc/Object.h>
@interface WidePopupManager:Object
{
    id button, popupList;
}
- initWithButton:aButton andList:aPopUpList;
- popUp:sender;
@end

/* WidePopupManager.m */
#import <appkit/appkit.h>
#import "WidePopupManager.h"
@implementation WidePopupManager
- initWithButton:aButton andList:aPopUpList
{
    button = aButton;
    popupList = aPopUpList;
    [popupList sizeToFit];
    [button setAction:@selector(popUp)];
    [button setTarget:self];
    return self;
}
- getBounds:(NXRect *)theRect{
    NXRect popupFrame;
    [popupList getFrame: &popupFrame];
    [button getBounds: theRect];
    if (theRect->size.width < popupFrame.size.width - 1)
        theRect->size.width = popupFrame.size.width - 1;
    return self;
}
- setTitle:(const char *)aString {
    [button setTitle: aString];
    return self;
}
- convertPoint:(NXPoint *)aPoint toView:aView{
    return [button convertPoint:aPoint toView:aView];
}
- popUp:sender { return [popupList popUp: self];}
- window { return [button window]; }-
display { return [button display]; }-
(BOOL) needsDisplay { return [button needsDisplay]; }
- (const char *) title { return [button title]; }
@end
```


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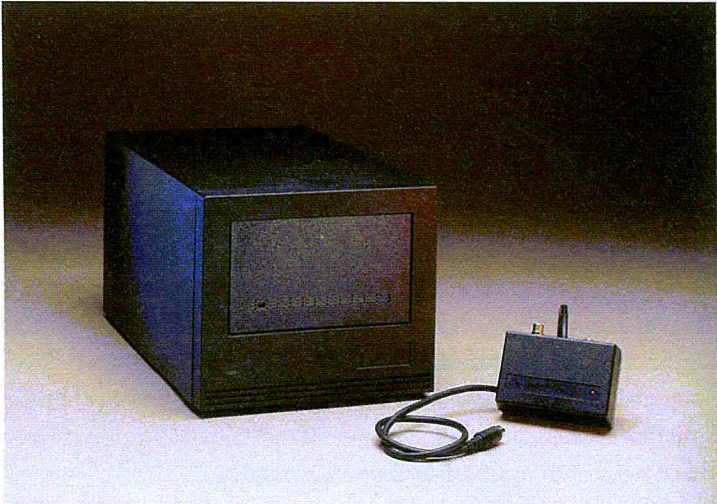


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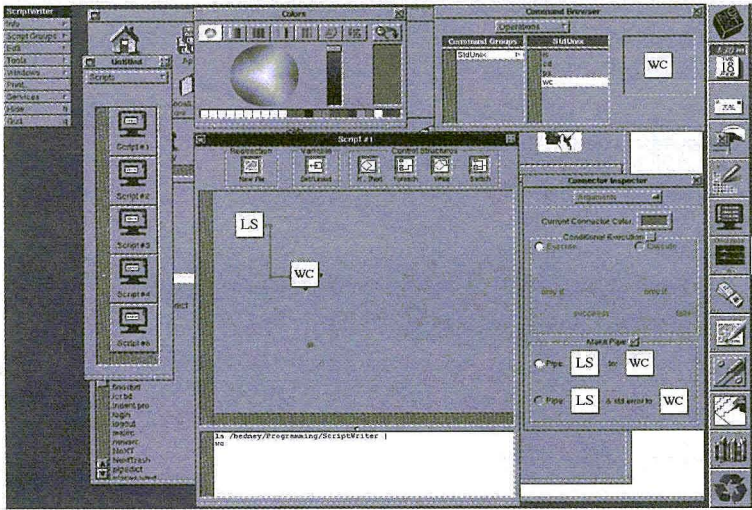
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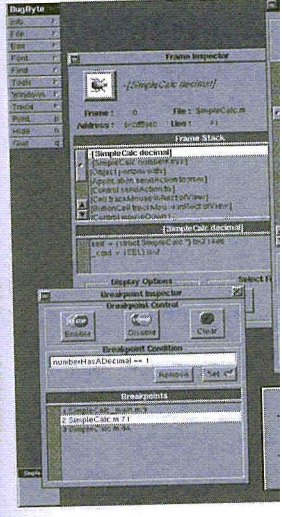
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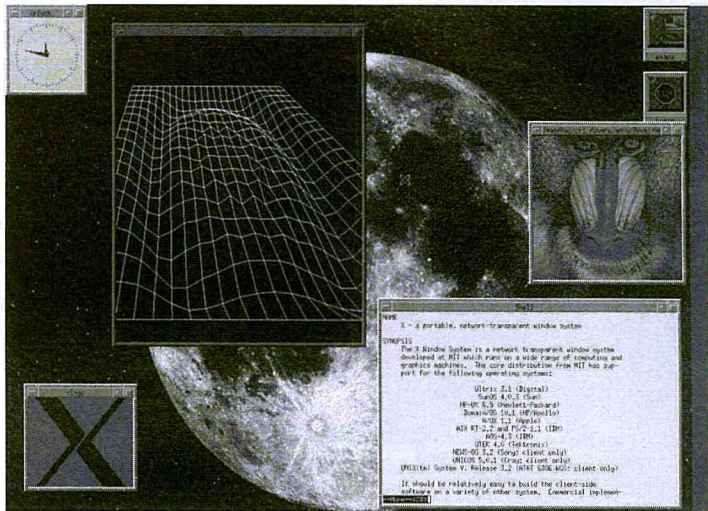
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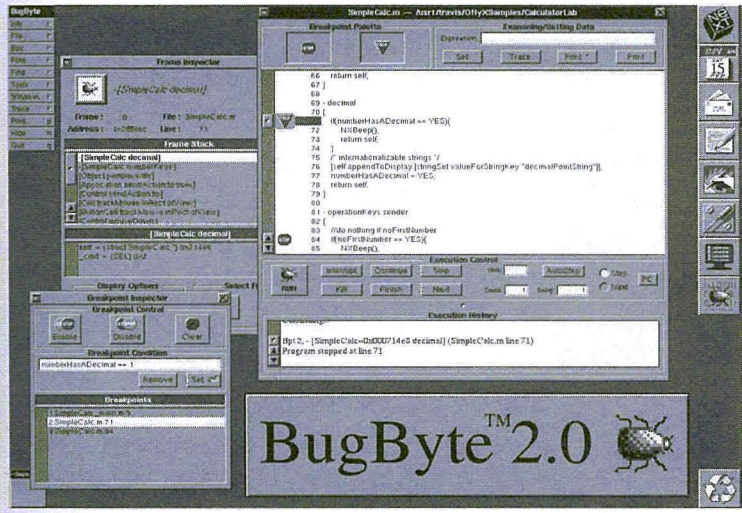
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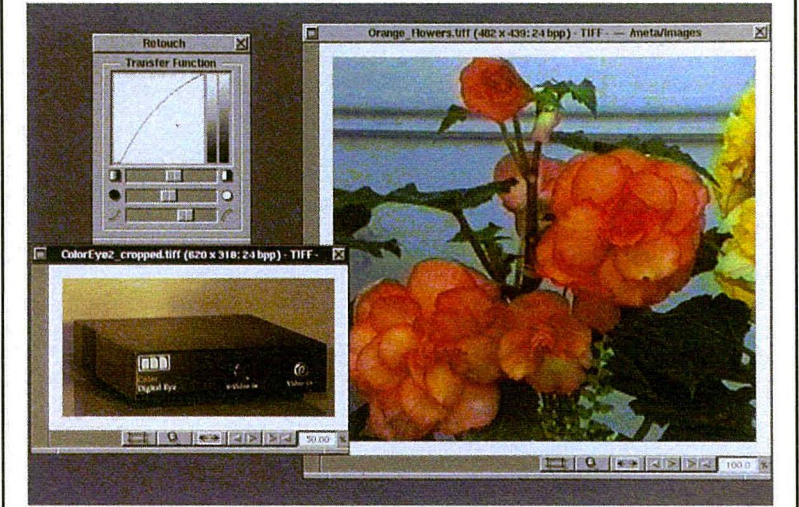
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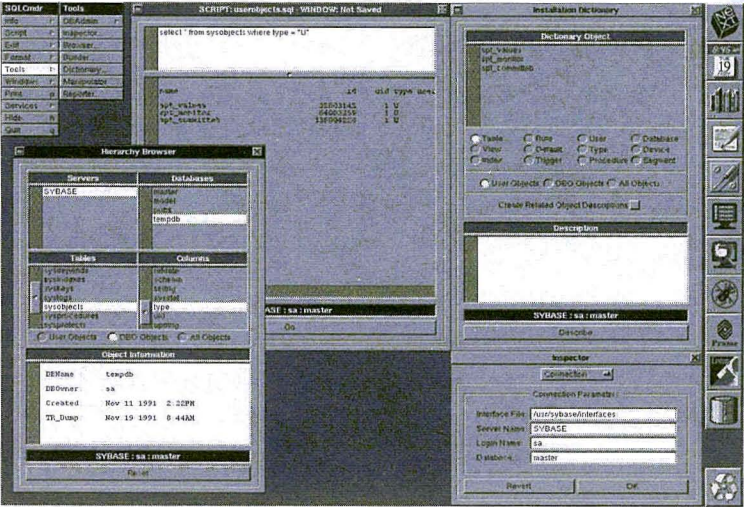
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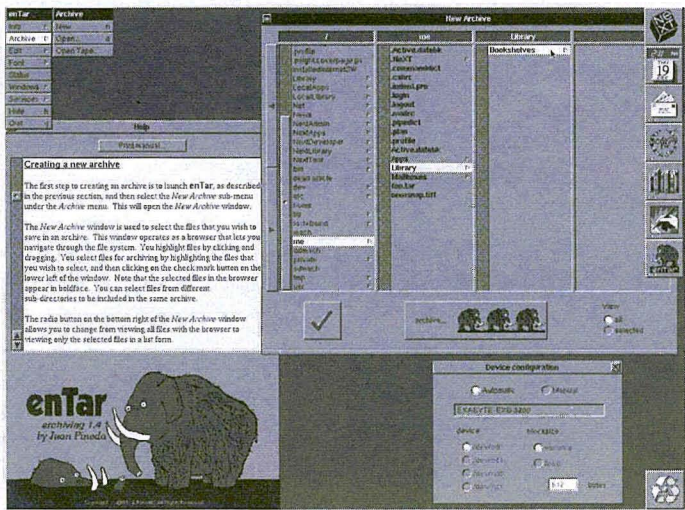


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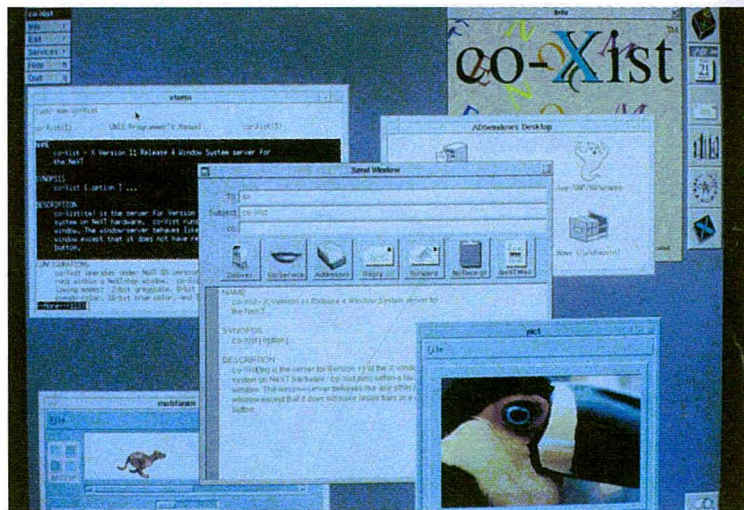
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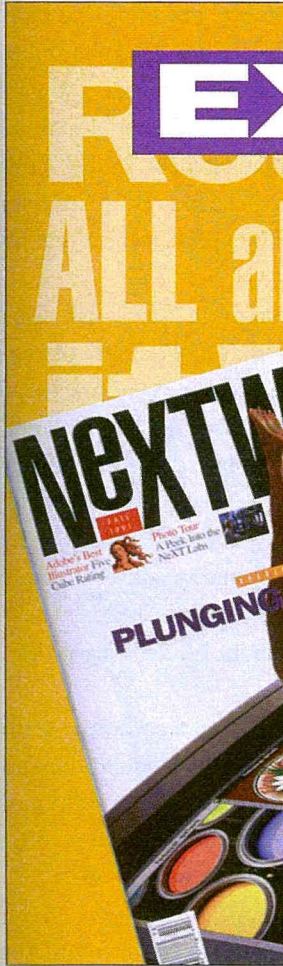
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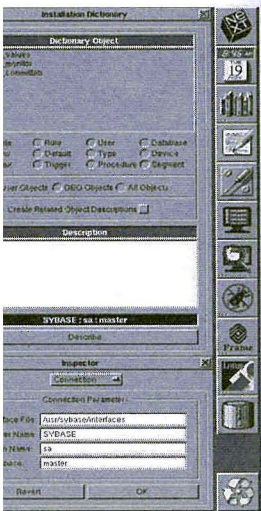
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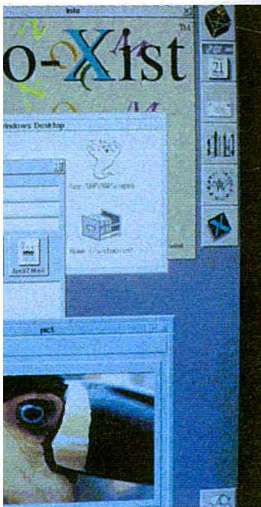
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NeXTWORLD

PLUNGING INTO COLOR

NeXTWORLD EXTRA

NetWare and AppleShare support
to fulfill promise of mixed networks

Poppycock!" When they tell you NeXT computers are proprietary, that's what you're supposed to say. At least that's what NeXT's fearless leader told the crowd at NeXTWORLD Expo.

Poppycock, indeed. Do Steve a favor and take my advice, not his. Sit down at your NeXTstation, call up the definition of the word "proprietary," and you will see that the selfsame machine and its software are indeed proprietary. But this is not a sin. UNIX and DOS are also proprietary systems. The UNIX System Laboratories and Microsoft own the intellectual property rights to these products and have the exclusive right to sell or license them.

Proprietary isn't the issue – open versus closed is the issue. What Steve meant is that NeXTstep '486 represents another step up the continuum of benefits that open systems provide users and vendors. And it is an important step because NeXT stood, until now, in the "interoperability is enough" camp. The company met its customers' requirements for connectivity, file sharing, and database access but allowed no portability whatsoever. It insisted in tying applications developed with Interface Builder to a single OS and source of hardware.

The new benefit NeXTstep '486 delivers is source-level applications portability between hardware platforms with different architectures and from multiple sources. Competition between NeXT and Intel-based machines is a good thing for the customer. It's also good for NeXT because most organizations these days won't buy anything without a second source. NeXT's theoretical deal with IBM just didn't cut it. NeXTstep never even made it into the IBM product catalog.

Initially, cannibalization will be low because NeXT's strategy on the Intel platform is confined to the high end of the PC hardware market. In particular, the minimum recommended configuration of NeXTstep '486 requires 8MB of RAM for grayscale (16MB for color), a 120MB hard drive (400MB for the developer version), and a workstation-quality display (SuperVGA with resolution of at least 1024 by 768 pixels, which is roughly comparable to NeXT's screen resolution).

This is hardly the garden-variety '486-based machine. Early adopters of NeXTstep '486 will be buying new machines to run it on, workstation-class models with graphics on the motherboard. These machines will be priced in the \$10,000 range, twice the price of the entry-level NeXTstation. Pricing won't matter to some customers, however. They'll figure they're reducing risk to the same level as buying software from a start-up with a pretty good track record.

In addition, it will be possible to soup up existing '486 machines to accommodate NeXTstep. It can run in grayscale mode with an existing SuperVGA graphics adapter that supports a 1024-by-768-pixel display. Color requires a new 16-bit EISA card; several should be available when NeXTstep '486 ships.

The point of all this for NeXT, at least initially, is to overcome the

company's difficulty in getting past the proverbial short list. If the short list is limited to hardware only, NeXTstep '486 is not a problem. If the short list prescribes both hardware and software, then NeXT can argue that it has met the customer halfway. After development and acceptance testing have been completed on familiar Intel platforms, the purchasing department can evaluate the alternatives. It may be that NeXTstations are more cost effective than Intel-based machines; it may be that workstation-class PC prices will have eroded to match NeXT's prices.

Therefore, NeXTstep '486 is a sound tactical maneuver. I will promote Steve to strategist when he announces NeXTstep on another hardware architecture such as Sun's SPARC or HP's Precision. Fully decoupling NeXT's software business from its hardware business would mean taking on Microsoft – the computerless computer company, as described in last July's *Harvard Business Review* – at the high end of its product family.

Three other major UNIX players are already in the race, but NeXT still has a chance. It is the only company I know that gets unsolicited testimonials from both end users and corporate MIS heads.

To succeed, NeXT will have to change its ways. Given that it cannot compete with Microsoft in playing Pied Piper to independent software vendors and will not compete with the UNIX-philes in zealous commitment to public and consensus standards, NeXT is positioning itself as foremost in productivity for developers and ease of use for end users.

But this does not eliminate the customer need for interoperability. For NeXT to be even a respectable member of the interoperability camp, it needs to take off its blinders toward other vendors' efforts in multimedia mail and distributed object management. NeXT's own technology in these areas may be great, but it

will have to support cross-platform standards if it expects to be a real player in interpersonal computing.

Despite Steve's NeXTWORLD Expo presentation, NeXT still displays an ambivalent attitude about standards. If there isn't a blindingly obvious standard, inventing one is not necessarily the best course. Vendors are gradually learning that collaboration in early phases saves time, money, and heartache. Will NeXT be willing to work proactively and collaboratively with the open-systems community in developing consensus-standards? To date, it has participated in the initial work on Display PostScript and Unicode, so there is some precedent. NeXT says it monitors consensus standards developments, but, as a 600-person company, has insufficient resources to participate. To me, this says more about NeXT's priorities than about its resource constraints.

In the past year, I have seen NeXT go from having a toe in the water of open systems to having a foot in the water. To really compete in the open-systems world, it is going to have to wade in waist deep. It can still innovate by building standout features on top of base-level standards. But it can only succeed in standing out from the crowd if it first fits in with it. ♦

NINA LYTTON is editor of the Open Systems Advisor newsletter.



Open and Shut

NINA LYTTON

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